

# FACTS » that « FIGURE

70<sup>th</sup> Anniversary Edition  
1 | 2015



*The key  
to your profit!*



## Bangkok – Thai Capital is the Venue for H&N’s 70th Anniversary Celebration

*(Pictured: Temple of the Dawn, a Famous Bangkok Landmark)*

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# 70 Years OF GENETIC PROGRESS

In a world that is rapidly changing and in which food security is increasingly globalized, it is interesting to remember where the egg industry started 70 years ago, and how H&N has always been able to cope with the challenges of the times and changing demands.

When most egg producers around the world were still working with traditional breeds and basic pure – or single – breed improvement, Art Heisdorf recognized the benefits of crossbreeding. He established his company “Heisdorf & Nelson Farms” (now H&N International) with a focus on three pillars:

- A set of egg production lines with outstanding combining ability
- A science-based breeding program focused on long-term genetic progress
- A team of competent specialists dedicated to developing the best possible laying hen.

## A solid start

Many independent egg-type breeding companies were operating in the booming post-WWII market, and unbiased random sample tests at the time helped to identify the most successful commercial laying strains available. During the late 1940's and throughout the 1950's, the H&N “Nick Chick” won more random sample

tests in the USA than any other strain.

The general superiority of strain crosses over pure breeds became an accepted fact, and this made two things clear to egg-type breeders: they needed at least two different lines, and these lines had to be further improved to remain competitive. Different theories had been proposed to explain the phenomenon of heterosis (hybrid vigor), including dominance (the superiority of cross-line progeny over the average of two parent lines), over-dominance (superiority over the better of two parent lines) and epistasis (the effect of one gene being dependent on the presence of one or more modifier genes). Several breeding companies were experimenting with inbreeding to develop “inbred hybrids” as candidates for new commercial varieties.

## A winning theory

Art Heisdorf knew from professional experience and existing literature that inbred lines are difficult to work with. When the RRS (reciprocal recurrent selection) theory was first presented in 1947 by plant breeders at the “Heterosis Conference” at Iowa State University, he hired additional geneticists to put this theory into practice in his breeding programs. Theoretically, RRS should maximize long-term genetic progress because alleles that control over-dominance

will eventually be fixed at opposite frequencies in the two parent lines, resulting in progeny that are all heterozygous.

We still don't know how important over-dominance really is, but the concept has reinforced the principle that each pure line is kept as a “closed gene pool”. Over the past 70 years, no new genetic variation has been introduced into the original H&N lines – a time span equal to almost 70 generations. Although we refer to our base lines as “pure lines”, they are not “pure” in the sense of plant breeders. A recent analysis of our pure lines – based on a great deal of data from several generations – confirmed that we still have a lot of genetic variation. This ensures further genetic improvement by selection within each line for many years to come.

## Decades of managing risk

The environmental conditions under which the H&N base lines are kept and improved have changed dramatically over the years. Visitors trying to find the former “Hollywood Hills Farm” in Kirkland, Washington, where Art Heisdorf started his breeding program, will find expensive private homes instead of traditional, open-housed chicken sheds. Commercial eggs are now produced at “Rainier View Farm”,

built in the 1960s according to the new and modern standards of bio-security.

Today's up-to-date breeding facilities are spread over a sufficient number of isolated farms on different continents to combine maximum bio-security for the breeding program with geographical flexibility. This ensures our ability to supply international customers with parent stock in the event that government authorities put a ban on imports from particular source locations, for instance in response to an Avian Influenza outbreak.

Expanding and relocating breeding programs while genetic progress continues requires ongoing learning and training of employees in the application of new techniques, as well as close cooperation among all members of the H&N team. A breeding company needs well trained and motivated people who are dedicated to the goal of maximizing genetic progress. H&N owes its commercial success to each and every team member who not only take care of their responsibilities, but who actively take an interest in suggesting ways to improve working conditions and data recording accuracy.

## Breeding for the future

Selection theory is generally based on two simple assumptions:

- selection is only practiced for a single trait (ideally in opposite directions, with a control line and replication)
- uniform or controlled environmental conditions over many generations

Neither of these assumptions can be used in the real world of poultry breeding, where a complex selection index is frequently redefined to ensure a desirable performance profile in years to come, and in which environmental conditions cannot be completely standardized.

Before each selection, geneticists must monitor genetic parameters and anticipate changing requirements when they define the selection index for each line. Annual genetic progress for individual traits may be too small to be noticed in detail in the field. However, the total be-

nefit in terms of egg quality, feed efficiency and improved egg numbers accumulates over the years, and helps egg producers to remain competitive.

While H&N as a primary breeder is focused on cumulative genetic progress, the franchise hatchery has to build its image and commercial success on sharing available management information with egg producers. Close communication between breeding company service representatives and the managers of franchise hatcheries ensures that commercial egg producers can know which improvements they can expect from the latest parent stock. Simultaneously, specific market preferences can be taken into account when placing new orders for parents.

One thing that our customers – and their customers – can count on is continuous improvement. Despite 70 years of selection within a closed gene pool, all lines involved in the H&N program show continued selection response for all major traits. More accurate recording technologies combined with comprehensive genomic markers will enhance the rate of progress. This unique gene pool is a proven source for a bright future.

*Prof. Dr. Dietmar Flock  
and Prof. Dr. Rudolf  
Preisinger*



# H&N and Agromix

## a growing partnership



Agromix Broederij en Opfokintegratie (Agromix Hatchery and Rearing Integration), better known as Agromix, was founded in 2010 as an independent rearing integration operation. Since then, it has established a productive and still-growing relationship with H&N.

When a significant change in distributors took place in the Netherlands in 2011, Agromix acquired the rights for H&N in the Netherlands, along with Hy-Line – another EW Group brand. At the same time, Agromix got the opportunity to build a brand-new hatchery in Afferden, the Netherlands, with an original capacity of 10 million hen chicks for the layer business.

### Installing the best

Agromix began by installing H&N Brown Nick PS (parent stock) in the hatchery in 2012 in order to offer the highest quality brown table eggs to the commercial market in the Netherlands. The product met with great success, especially in aviary, free range, and organic.

Because of an increase towards egg products, it was decided at the beginning of 2013 to also install H&N Super Nick PS in the Netherlands. Agromix launched this

totally new white-egg bird in the Dutch market with a well-attended seminar for layer farmers. The first commercial flock in colony, aviary and free-range farms were in production by November 2013, to the great satisfaction of Agromix and its customers. The original 10 million hen-chick capacity of the new Agromix hatchery had increased to approximately 15.5 million by the end of that year.

### An expanding collaboration

About 50% of the hatchery's production is used for the Dutch layer market, and the other 50% for the export activities of Agromix's sister company Pluriton Ltd. Pluriton is specialized in the export of layer hatching eggs and day-old chicks (primarily from the Hy-Line, H&N and Lohmann Tierzucht brands), as well as the export of hatching eggs. The company's strengths are its speed, reliability, flexibility, and customer focus, as well as its careful protection of logistics routes. These are also

leading to increasing growth in export collaboration between H&N International and Pluriton.

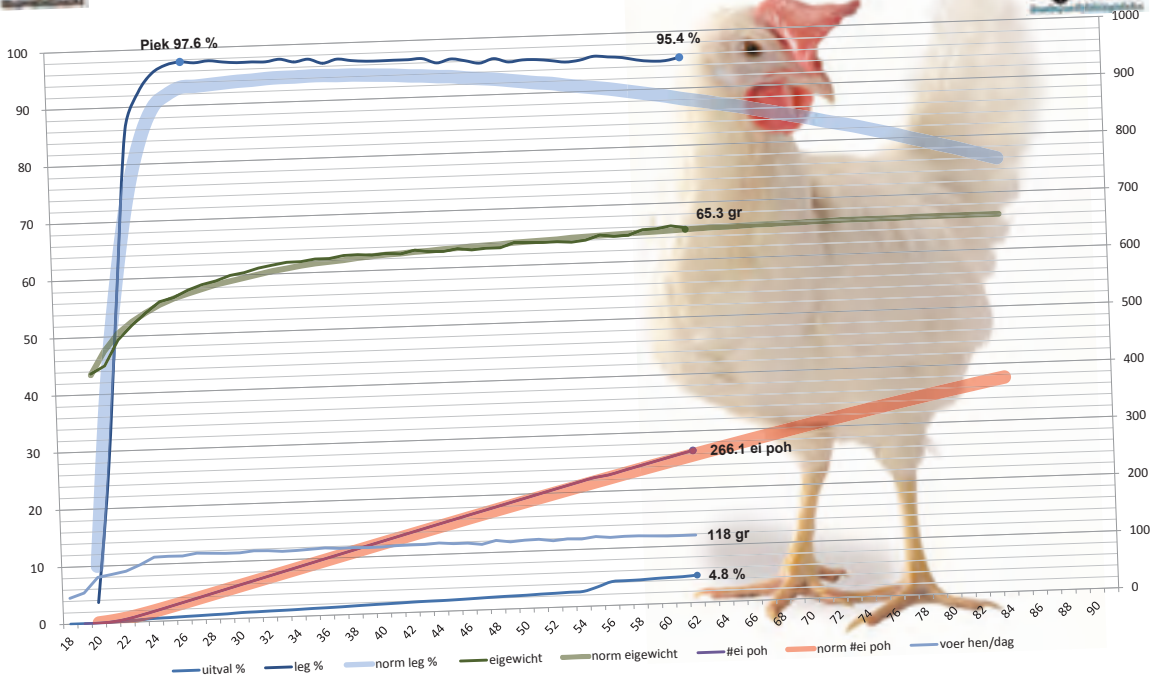
In total, the Dutch market now has about 34 million layers, which translates into an annual exchange of a maximum of 24-25 million. In 2014, Agromix produced nearly 8 million day-old chicks for the Dutch market, which puts the company's current market share at the moment at some 30%. Approximately 4.5 million of these chicks will be reared by Agromix, and sold as pullets to the Dutch farmers.

At the moment, Agromix has approximately 60,000 H&N Brown Nick and 60,000 H&N Super Nick PS. The mutual goal for the future in the Netherlands is to keep up the good H&N results, and to attempt to get a bit more market share – especially with H&N products. And looking farther abroad, Agromix aims to provide support to H&N International, especially in new export markets, with the delivery of H&N hatching eggs and day-old chicks.

*Leon Schouren*

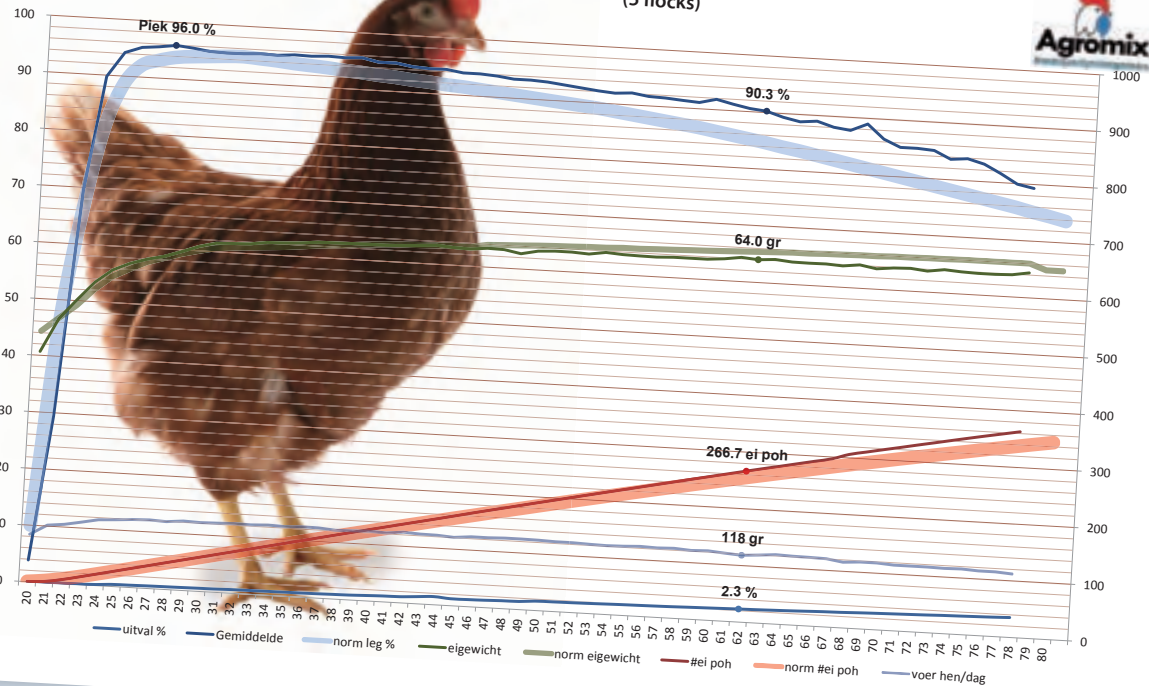
# H&N SUPER NICK

Results on 62 weeks  
(5 flocks)



# H&N BROWN NICK

Results on 62 weeks  
(5 flocks)



These graphs present the current results of the oldest flocks (at press time, close to 80 weeks) of H&N Super Nick and H&N Brown Nick in the Netherlands. Data was collected from Dutch farmers in the colony and aviary sector.

# SUCCESSFUL CUSTOMER SEMINAR IN LUCERNE, SWITZERLAND.



**In October 2014, Franz Hodel and his team at SA Prodavi, played hosts to more than 100 guests in the conference center of the Grand Casino in Lucerne, Switzerland. The guest list included laying hen farmers and representatives of the layer poultry industry.**

Presentations were held by experts from Germany and Austria. Special focus was paid on successful layer management without beak treatment. The seminar was officially opened by Franz Hodel, General Manager of Prodavi SA. Prof. Knut Niebuhr from the Department of Animal Welfare at the University in Vienna, highlighted positive experiences in Austria after the first years of managing layer flocks whose beaks were not treated. He mentioned that active monitoring of the farms and seminars for egg producers have definitely improved the management skills of the farmers. The management of layers has significantly helped in reducing misbehavior like feather-pecking and can-

nibalism in commercial layer flocks. Dr. Hans-Heinrich Thiele, H&N's Technical Service knew how to get the audience's attention by introducing the different layer varieties of the company. He also discussed the breeding program at H&N International. He mentioned that selecting against feather-pecking and cannibalism is and remains an important breeding goal for the company. The last speaker, Mr. Robert Pottgüter, Nutritionist at H&N International, focused on the relevance of layer diets. A good structure will keep the hens busy with eating their daily rations thus allowing them less time for misbehavior like feather-pecking and cannibalism.

*Mohammed Chairi and Dr. Hans-Heinrich Thiele*



Photo Caption: Dr. A. K. Rajput with his Life Time Achievement Award

# PRESTIGIOUS AWARD FOR H&N'S INDIA COUNTRY HEAD



Dr. A. K. Rajput, H&N's India Country Head was recently the recipient of a Life Time Achievement Award from the Indian Ministry of Agriculture for his many years of outstanding service to the Indian poultry industry. In his role as the Executive Director of the All India Poultry Breeders Association, Dr. Rajput has made significant contributions in forging cooperation between the Government of India and the Indian poultry industry. His efforts have significantly aided the Indian Ministry of Agriculture in shaping and guiding policy matters for the poultry and animal husbandry sectors throughout the country.

Dr. Rajput's distinguished career in the poultry industry has been formed by very rich and wide ranging experience. His detailed knowledge of regulatory matters and his close working relationships with and access to key government officials have enabled him to make important contributions to the progress of the Indian poultry industry.

*Rich Wall*

**VIV Asia**  
11<sup>th</sup>–13<sup>th</sup> March, 2015



From 11 to 13 March 2015, the VIV Asia is taking place in Bangkok, Thailand. After 2013, the team from H&N International GmbH will again participate in 2015 with a new innovative booth in hall 106, stand B76. We are looking forward to interesting talks, an international exchange with the highly qualified trade audience and overall to a promising and successful time in Bangkok.



# H&N RETURNS

## to UK market

H&N International is introducing the H&N “Brown Nick” layer to the UK. This marks a historic return to the UK market, from which H&N has been absent from for more than 40 years. The “Brown Nick” will be sold under the name “H&N Brown” and is targeted at meeting the demands of egg producers seeking to prolong the single-cycle production length of their flocks.

A new distribution company known as H&N GB has been established to support the new venture, which is being headed by Mr. Keith Henderson. H&N GB will be based at the Farm Fresh Hatchery in Tarleton, Lancashire. Mr. Henderson believes that parent stock will be a good fit in the market. “The color and strength are its outstanding features,” he says. H&N Brown will appeal to customers looking to extend their flocks even beyond 80 weeks before depletion. It will fit in well with alternative production systems, though it should also perform well in colonies.”

### Moving ahead

Initially, hatching eggs will be shipped to the UK from parent stock in Germany and hatched at Tarleton, but the plan is to establish parent stock farms soon in the UK. According to Mr. Henderson, the Farm Fresh site, which currently custom hatches for Lohmann and Hy-Line, should be “H&N Brown only” by the end of this year.

This suggests rapid market penetration. However, Mr. Henderson, who also operates the major started-pullet producer, Blue Barns Poultry Farms, says that the H&N Brown will benefit from a ready-made distribution network. This will also give H&N GB the opportunity to extend its sales nationwide.

*Rich Wall*





(l. to r.) Mr. Murat Boylu, Finance Mgr.; Dr. Ethem Kurucay, Director of Production & Technical Service; Mr. Tolga Camci, General Mgr.; Mr. Nazim Camci, Chairman & CEO (seated); Mr. Tuncay Camci, Vice Chairman; Dr. Seyda Aydin, Yenisehir Hatchery Mgr. and Dr. Atakan Can, Subasi Hatchery Mgr.

## Oz Tavuk marks 25<sup>th</sup> anniversary of partnership with H&N

This year marks the 25th anniversary of business cooperation between Oz Tavuk A. S. from Yenisehir, Bursa, Turkey and H&N International. Oz Tavuk was founded in 1990 by Mr. Halil Camci and his three brothers Yurdanur, Chazim and Nazim. The Camci brothers were originally egg producers, but decided they needed to have control over their own chick supply, prompting them to enter the hatchery business. The company was originally known as Camcilar, originating from on their family name. Early on, the brothers decided to concentrate solely on the hatching and distributing of layer chicks. In the first year, they placed 10,000 H&N "Brown Nick" parent stock. All of the chicks were supplied from the original hatchery in Yenisehir. Later, Oz Tavuk negotiated custom hatching contracts with several major Turkish broiler integrators, and the company embarked on the broiler chick business that continues to this day.

### Onwards and upwards

From its humble beginnings, Oz Tavuk expanded at a steady pace over the years. In 2015, the company will place a

total of 187,000 layer parent stock from H&N. There are now three hatcheries in operation: two in Yenisehir, and one in the city of Hendek, about three hours by road from Yenisehir. The total capacity for layer chicks is 20 million per year. Oz Tavuk now has a housing capacity for 220,000 H&N layer parent stock, growing and laying combined. Almost all of Oz Tavuk's breeder houses are a controlled environment, and most feature automated egg collection. The breeder farms are all free of vertically transmitted poultry diseases. In order to supply their own needs for custom formulated feed and to ensure more complete biosecurity, Oz Tavuk even has its own dedicated feed mill. During 2015, construction will begin on a new hatchery that will have the capacity to produce all of the company's needs for layer chicks.

### A family business philosophy

During 2014, Oz Tavuk sold a total of 14 million H&N layer chicks to the domestic Turkish market. There are already confirmed orders for 8.5 million layer chicks for 2015. Last year, the company also infra-red beak treatment for those customers

requesting this service. The Camci family feels their success is down to a business philosophy that encompasses the following key points:

- Consistent, punctual delivery of prime quality, healthy chicks, according to the order quantities demanded by the customers
- A timely, attentive and meaningful follow-up customer service
- Always keeping promises to the customers.

The Camci brothers passed on these principles to the second generation of the family, which has now assumed the task of managing the company. Nazim is now Chairman of the Board, while Tuncay Camci (Yurdanur's son) is Vice Chairman and Tolga Camci (Nazim's son) is the General Manager. Dr. Atam Kurchai has been the Director of Production and Technical Service since the company was founded.

It is with a sense of pride that Oz Tavuk claims that 65% of their customers have never changed to another chick supplier. Oz Tavuk is built on a very sound business and financial foundation, which will enable it to continue being a major supplier of layer chicks in the Turkish market for many years.

*Rich Wall*

# ECONOMIC ADVANTAGES OF H&N “BROWN NICK” VS. COMPETITIVE BROWN EGG BREEDS STRAINS TO 74 WEEKS OF AGE BASED ON USTRASICE RANDOM SAMPLE TESTS

Averages of results from conventional and enriched cages over a ten year period (2004 to 2014) indicate significant economic advantages for H&N Brown Nick over competitive brown egg strains. If only one test was involved this could be dismissed as a sampling error or advantages during the test for one strain (i. e. equipment malfunctions or other problems unrelated to genetic potential). However, when ten tests are involved, it is time to see what these advantages would mean on a commercial scale. A table summarizing the ten year test summary follows. When reviewing these results please note:

- Only brown egg strains entered in at least five tests were included in our summary.
- White egg, tinted egg and Silver type brown egg strains are not shown in this summary.

To put these results into a commercial context, consider the effects on a commercial egg operation with 100,000 layers. During a 56 week production cycle up to 74 weeks of age, the economic impact of Brown Nick's advantages in comparison to the average of all strains are as follows:

## Eggs Per Hen Housed

Brown Nick has an advantage of 1.5 eggs per hen housed. This means approximately 150,000 more eggs during the entire cycle. Assuming a price of 6 Euro cents per egg, this equates to additional egg income of EUR 9,000.

## Feed Conversion Ratio (FCR)

Brown Nick needs 0.3 gram less feed intake per egg produced. Assuming average hen day production of 85 % or 85,000 eggs per day means “Brown Nick” will produce 33.320 million eggs during the entire cycle on 9.996 less tons of feed to produce the same number of eggs. At a feed price of EUR 225 per metric ton, this represents a savings of EUR 2,249 in feed costs.

## Egg Quality; Cracked Eggs

“Brown Nick” has an advantage of 0.53 % less cracked eggs. Again assuming average hen day production of 85 % for the entire cycle this means “Brown Nick” on average will have 450 more saleable eggs per day than the average of all strains in this analysis. Over the entire cycle, this adds up to 176,596 more saleable eggs. Assuming cracks and other undergrade eggs fetch a price that is 35% lower than sound, good quality eggs and again assuming a price of 6 Euro cents per egg, the price for undergrades becomes 3.9 Euro cents, a loss of 2.1 Euro cents per egg. This then equates to an advantage of EUR 3,708 for “Brown Nick”.

## Lay Cycle Mortality

Brown Nick has 0.1% lower lay cycle mortality. Over the course of the entire 56 week production cycle, this means there are going to be 100 more Brown Nick layers left alive to be sold as spent hens. Not all mar-

kets have a demand for spent layer hens. However, if we take the case of Malaysia a normal spent hen price in that market can be 55 Euro Cents per bird. This means EUR 55 additional spent hen income.

## Summary of “Brown Nick” Economic Advantages

In addition, Brown Nick has an egg weight

Additional Egg Income	EUR	9,000
Savings in Feed Costs	EUR	2,249
Fewer Cracks	EUR	3,708
More Spent Hen Income	EUR	55
<b>Total Economic Advantage</b>	<b>EUR</b>	<b>15,012</b>

advantage of 0.8 g over the average for all strains and it has the second highest egg weight. As we can see in the following table, Brown Nick is clearly ahead when profitability is calculated with the assumption that eggs are sold by weight. With the egg weight advantage over most of the competing strains, it is reasonable to assume Brown Nick would also have a higher percentage of large eggs for markets where eggs are sold by size or grade.



## Summary

In addition to the economic benefits already presented, Brown Nick exhibits the following advantages compared to the average for all breeds:

- 0.38 kg higher accumulated egg mass
- 0.04 better FCR on a kg/kg basis
- Better shell strength so eggs are better able to withstand grading, packing and transport.
- Darker shell color which is especially important where buyers are more critical of any egg quality faults.

The advantages of Brown Nick depend on the particular breed to which it is compared to. A careful analysis of potential flock performance is always useful when deciding on the next placement of parent stock or commercial layers for your operation.

## Performance Results of Brown Egg Strains to 74 Weeks of Age Based on Ustrasice Random Sample Tests 2004–2014; Averages from Conventional & Enriched Cages

	No. Yrs. In Test	Eggs/HH	Hen-Day Prod. (%)	Avg. Egg Wt. (g)	Total Egg Mass/HH(kg)	Feed Cons. (g/bird/day)	FCR (kg/kg)	FCR (g/egg)	Lay Cycle Mort. (%)
<b>H&amp;N "Brown Nick"</b>	10	345.7	88.2	63.3	21.83	126.0	2.23	142.9	3.8
<b>Lohmann Brown Classic</b>	10	342.8	87.4	63.4	21.72	125.6	2.24	143.6	4.3
<b>Lohmann Brown Lite</b>	9	346.6	88.4	62.4	21.51	125.2	2.25	141.6	4.2
<b>ISA Brown</b>	9	343.9	87.7	62.3	21.43	125.4	2.26	142.9	4.0
<b>Hisex Brown</b>	10	346.3	88.3	62.5	21.54	126.0	2.25	142.6	5.0
<b>Hy-Line Brown</b>	9	339.2	86.5	62.6	21.20	124.0	2.27	143.3	2.4
<b>Bovans Brown</b>	7	347.4	88.6	62.7	21.71	126.9	2.27	143.2	4.1
<b>Tetra SL</b>	8	338.1	86.3	61.9	20.86	125.3	2.32	145.3	3.5
<b>Novogen Brown Classic</b>	5	348.2	88.8	61.3	21.22	127.2	2.32	143.2	3.9
<b>Averages</b>	–	<b>344.2</b>	<b>87.8</b>	<b>62.5</b>	<b>21.45</b>	<b>125.7</b>	<b>2.30</b>	<b>143.2</b>	<b>3.9</b>

	Shell Strength (N) **	% Cracks	Shell Color+	Body Wt. (g)	Age @ 50% HDP (Days)	IOFC/HH (Euros)*	No. Times Ranked First in IOFC/HH
<b>H&amp;N "Brown Nick"</b>	41.8	2.16	13.5	2,027	143	7.74	3
<b>Lohmann Brown Classic</b>	42.0	2.25	13.6	2,042	143	7.67	3
<b>Lohmann Brown Lite</b>	40.3	2.13	13.9	2,022	143	7.53	0
<b>ISA Brown</b>	35.4	3.03	17.9	1,957	144	7.46	1^
<b>Hisex Brown</b>	37.1	2.95	16.0	1,968	142	7.51	2
<b>Hy-Line Brown</b>	35.2	3.07	14.0	2,038	141	7.32	0
<b>Bovans Brown</b>	36.8	2.90	16.4	1,992	141	7.54	2^
<b>Tetra SL</b>	35.7	2.95	14.3	2,039	143	7.01	0
<b>Novogen Brown Classic</b>	39.0	2.74	18.5	1,982	141	7.14	0
<b>Averages</b>	38.1	2.69	15.3	2,007	142	7.44	–

### Notes:

\* Income over feed cost per HH in Euro or US\$ = (0.8 x EM)-(0.2 x EM x FCR). Figures mentioned in the table are simple averages of the tests entered.

\*\* 9.81 Newton (N) = 1Kp

^ These strains were tied for first in IOFC/HH one year.

+ Shell Color Index = L – a – b

L= Brightness or reflection value (100=white; 0=black) | a= Red and green color spectrum | b= Yellow and blue color spectrum  
Lower score indicates darker eggshell color

- All breeds subjected to the same feed, housing and management conditions.

*Prof. Dr. Dietmar Flock,  
Dr. Matthias Schmutz and Rich Wall*

# LATE LAY-CYCLE MORTALITY

## PROBLEMS, CONSEQUENCES & SOLUTIONS

Excessive late lay-cycle mortality negatively impacts hen-housed flock performance figures and consequently profitability. But before examining causes, effects and solutions that can help to avoid or manage this problem, it is perhaps useful to first look at the flock performance data, and the economic assumptions and consequences that are involved.

Our definition of late lay-cycle is the period from 60 to 90 weeks of age. The December 2014 production cost for 18-week-old started pullets in the USA was US\$3.26. The January 2015 mid-west USA farm-gate price for large (57g or more) unprocessed eggs was 10.58 US dollar cents per egg. While not all markets have demand for spent white-egg layer hens, there are certain world markets where spent-hen income can contribute significantly to egg-producer profits. For our analysis, we will use the example of the Philippines. The spent-hen price in this market is typically around US\$1.75 per bird on a live-weight basis.

### Flock performance

The most complete, accurate and reliable flock data available to H&N at press time comes from Turkey. This involves 13 flocks of H&N Super Nicks with a total population of 705,498 layers. Flocks were housed in conventional cages in both curtain-sided and controlled-environment buildings. The production period was from 2011 to 2013. Average hen day production for these flocks was 75%. Average weekly lay-cycle mortality

to 59 weeks of age was 0.12 %, while in the period from 60 to 90 weeks of age it increased to 0.22 %.

### Financial consequences

Given the egg price in relation to the number of flocks and layers in the Turkish data, each increase of 0.1 % in weekly mortality from 60 to 90 weeks of age means a loss of US\$11,756.50 in egg income. An additional 21,165 birds are lost from 60 to 90 weeks of age. In a market like the Philippines, lost spent-hen revenue would amount to US\$37,039 – a significant negative economic consequence. Flocks with severe cases of Cage Layer Fatigue could even be rejected as unacceptable for slaughter and processing, which would result in much greater economic losses.

### A variety of causes – and solutions

There are a variety of factors that can lead to increases in late lay-cycle mortality. One of them is overweight flocks, usually accompanied by high abdominal fat deposition. The extra weight leads to more heat stress and prolapse mortality. Proper body weight management is therefore essential, and must begin from one day of age. The feeding of broiler-starter diets to replacement pullet flocks should be avoided. It is also important

to follow the diet-change recommendations mentioned in H&N layer management guides. As long as flocks meet body weight targets, the suggested diet changes (i.e., from starter to grower) should be made at the ages indicated.

Factors such as Fatty Liver



rolling and preventing FLS will also help prevent overweight flocks. Not using, or incorrectly executing, a phase-feeding program can aggravate FLS.

## The value of supplements

Levels of Metabolizable Energy should not exceed the recommendations listed in the H&N layer management guides. It has been proven that feeding a certain amount of crude fat – in the form of included fat and/or oil added into the diets – will support liver health in all circumstances. Good-quality fat and oil provides the best digestible source of energy with

works with both sources. However, in terms of proper nutrition, the fatty-acid profile should always be taken into consideration. It should be pointed out that increasing crude fat intake by adding fat or oil to the diet will not necessarily create fat birds, as long as the diet is balanced in terms of total energy, protein, and digestible amino acids.

Another valuable preventative is to always add Choline-chloride in the pre-mix or the main feed formula. Choline plays an important role in energy metabolism, which is basically done by the liver. So-called 'fatty liver diets' will be based on Choline-chloride at all times, and can be added on top of all layer diets if one sees the incidence of FLS. Instead of Choline chloride, betaine may be used for this purpose as well.

## Strengthening bones

CLF can sometimes be traced back to insufficient skeletal development during the growing cycle. It is important to keep in mind that 95% of the skeletal structure is completed by 12 weeks of age! The development of medullary bones primarily takes place during the pre-lay phase, and it is at this time that mineral nutrition is important. Fine calcium sources can be helpful: pay close attention to them and follow calcium particle-size recommendations in the H&N management guides.

As flocks age, the percentage of coarse calcium particles should continue to increase. Feeding additional coarse limestone (1.5 to max. 4mm particle size) in the afternoon or evening hours can deliver additional benefits. By "top dressing" the feed with this extra limestone, the amount of the calcium derived from the feed is maximized and the calcium metabolism of the bone is minimized. This helps to maintain shell quality and

bone strength but also minimizes the daily mobilization of the calcium reservoir in the bones. Metabolic stress is reduced, which results in healthier flocks.

## Additional preventatives

Another factor that can contribute to CLF is Vitamin D3 deficiency – supplementing readily available 1,25 dihydroxy vitamin D3 can address this issue. It is also important to ensure the proper Calcium Phosphorus balance. Phytase is now often used to achieve this in layer diets, but its activity must be correctly estimated. Nowadays, we are confronted with a wide variety of Phytase products, and each one claims to have different matrix values. Because of this, it is crucial to adjust matrix values when changing from one product to another – always carefully follow the dosing commendation for each product.

On an operational level, heat stress and its effects can also be relieved by proper ventilation system design, maintenance and management. Sufficient ventilation equipment such as fans, evaporative cooling pads and spray nozzles can greatly aid in promoting cooling of the flock environment. Adequately cooled drinking water (in a range of 18 to 20° C) will also help to reduce effects of heat stress. Other factors that can lower heat stress include proper roof insulation and reflective roof surfaces.

A last major cause of increased late lay-cycle mortality is immunosuppression. Vaccination program faults, incorrect administration of vaccines, mycotoxin contamination of feed, and exposure to diseases such as IBD, Marek's and Chicken Infectious Anemia Virus (CIAV) can all lead to immunosuppression. These are therefore areas that should be closely monitored.

*Dr. Gilbert Cervantes, Robert Pottgueter, Dr. Hans-Heinrich Thiele and Rich Wall*

Analyze Problem

02

Identify Solutions

03

Choose Solution

04

the lowest heat increment, which is highly beneficial under heat stress situations.

It makes no difference if the oil is of plant or animal origin – the principle





## FEEDING AND MANAGEMENT

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# Practices for brown egg pullets to avoid excessive egg size in the late lay cycle

### Why avoid excessive egg size?

First of all, excessive egg size will have a negative effect on shell quality, as the hen will only be capable of forming the same amount of shell, even when eggs become ever larger. Even in markets where eggs are sold by size or grade, there is little or no premium for eggs weighing in excess of 65 g. Thus, the prices received for these larger eggs usually do not cover the additional production costs involved. It is also

important to keep in mind that when eggs become too large, more shell-to-shell contact is likely to occur within the packaging. This would lead to higher levels of breakage during shipping, which would be even more pronounced during long-distance shipping, such as the exporting of eggs to foreign markets.

We must also keep in mind that excess egg size usually means excess body weight. One consequence of this is a reduced resistance to heat stress, especially in open houses in tropical climates. Abdomi-

nal fat pad size will often be larger as well, and this can lead to increased prolapse mortality.

### The role of lighting programs in controlling egg size

Correct design and management of lighting programs are essential in avoiding excessive egg size later in the life of brown-egg flocks. During the growth

period, it is important to avoid slow step-down lighting programs, as these tend to cause larger sizes. It is also important to give a sharp increase (at least two hours) in day length as soon as the average body weight reaches 1.4 kg. This will ensure that feed nutrients are channeled into egg production, and that there are no unwanted increases in body size and abdominal fat pad deposition.

## Nutritional considerations

Body weight control must begin on the first day in the brooding house. It is important to refrain from feeding broiler starter diets to layer replacement pullet flocks. Follow the recommendations mentioned in the “Brown Nick” layer management guide regarding diet changes. These diet changes should be made at the specified ages, as long as the flock achieves body weight targets. An important point is proper feeding of less nutrient-dense developer diets. This allows for body weight control, but at the same time developer diets allow flocks to sustain the eating capacity that will be needed to support early increases in egg production. Another important method for avoiding excessive egg size is judicious use of ingredients with high linoleic acid content, such as full fat soybean meal and rice bran.

In general, nutrition needs to focus strictly on the daily nutrient demand, which means mainly protein and amino acids. In order to achieve or adjust the correct daily nutrient demand, you must know the daily feed intake of the flock. Egg size is closely related to nutrient intake and so adjustment of nutrient intake will be key for proper egg size control. H&N publishes detailed data regarding phase feeding programs, together with formulation nutrient data for varying daily intake. This data needs to be the overall basis by which to control egg size.

The basic idea for the control of egg size is to dilute the diet if daily feed intake

increases. This needs to be done as early as possible. If a flock is out of control in terms of excess egg weight, it will be very difficult to stop the increase in egg weight, let alone decrease it. In this situation, the only option will be feed restriction, which H&N does not recommend. This kind of daily feed restriction happens naturally in countries facing high temperatures during summer or in hot, tropical climates.

On the other hand, low temperatures or the loss of feather cover will increase feed intake. As daily nutrient intake is related to daily feed intake, avoid or minimize the steady increases of daily feed intake, which often occur as flocks age. Around the world, it often happens that a phase feeding program will be reduced according to increased feed intake or is reduced to lower costs. This strategy may very likely counteract all dietary adjustments in terms of amino acids. For instance, it will increase or at least maintain daily feed intake. In order to avoid oversized eggs, run a smooth qualitative restriction. Nutritionally, this means maintaining energy on a certain constant level and widening the relation of all other nutrients with regard to energy. The exception is calcium, which needs to be increased as flocks age to ensure good egg shell quality.

All nutritional strategies intended to control egg size need to start very early in the rearing phase. Egg producers also need to conduct close monitoring of egg size from the beginning of the production period. A physical tool for controlling egg size might be the feed texture, as a more coarse texture will increase daily feed intake. Conversely, a fine texture can reduce daily feed and nutrient intake, especially if the flock is not accustomed to fine feed texture.

The key nutrients for control of egg size, regardless of the daily feed intake, include the following:

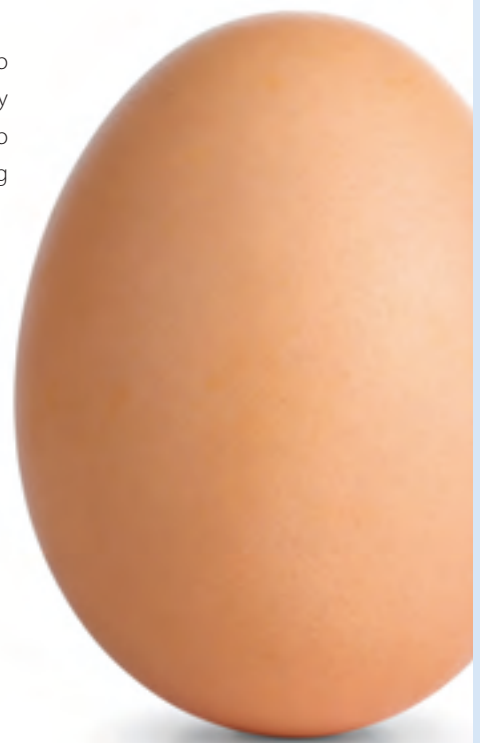
- crude protein
- digestible amino acids, especially Methionine
- linoleic acid

Amino acid levels need to be determined according to an optimal amino acid profile to avoid excesses or deficiencies of each amino acid, which might undermine the overall nutritional strategy.

Through practical experience and scientific data, it is known that adding fat and oil has a tendency to increase egg size, regardless of the type of fat or oil used. To some extent, this is due to a better utilization of the energy supplied by fat or oil, in comparison to energy derived from carbohydrates or starch in the diet. Quite often, adding fat or oil to mash feeds will increase palatability and consequently daily feed intake. This will increase egg size. So while it might be desirable to reduce added fat or oil in the diet, energy should not be reduced. These possibilities will be closely related to raw material availability.

In general, egg size control is part of an overall management approach, of which nutrition is only one part of the equation. Top company management must authorize and support all management practices, including nutrition, in order to be successful in avoiding excessive egg size late in the lay cycle.

*Robert Pottgueter and Rich Wall*



# BROODING CHICKS

## A critical step towards success

We all agree that brooding plays a critical role in the growth and survival of chicks. The main goal of brooding is to attain a low mortality rate during this period, as well as to ensure healthy and alert chicks that ready for the rigors of the rearing period. Good chick quality is very important in attaining these goals, but this is just one aspect of brooding. Just like in the rearing and laying periods, brooding management requires a complex approach to ensure that the chicks have a good start.

### Cleaning and disinfection

In order to have a successful brooding period, one cannot disregard the fact that a good cleaning and disinfection program is must. In this modern day and age of intensive poultry production, many farmers have resorted to short placement intervals between flocks. However, it is still recommended that the brooding house should be closed, vacant, dry and already disinfected for at least 10 to 12 days prior to the arrival of chicks. Any house repairs should have already been done before this period. In order to ensure that Biofilm is removed so that the disinfectant can take full effect, the use of detergents – together with physical cleaning like brushing and spraying with a power washer – is highly recommended before disinfection. It is also important that houses be completely free of organic matter such as feeds, feathers, manure, cobwebs and the like present before disinfection as this will lessen the effect of the disinfectants against the pathogens. In open houses, particularly those with slatted floors, many have failed to clean and thoroughly remove the organic matter underneath the slats. This should be inspected closely as any remaining organic matter can harbor harmful microorganisms which are detrimental to the health of the chicks. Two or three applications of

a good but safe disinfectant(s) is highly recommended. Although it should be used with extreme caution, the application of heat with the use of a blow torch is a simple but effective method of disinfection. Equipment, water and feeding systems should also be well cleaned and disinfected. In order to assess a house cleaning and disinfection program, a sanitation audit can be done by a competent laboratory. The use of insecticides right after the house is vacated is also a good practice so as to address any insect infestation left by the previous flock. When applying insecticides, special attention should be given to crevices on the walls and floors, as insects such as mites tend to hide in them. Application of the insecticides when the house is still harboring harmful insects will help prevent them from moving to the adjacent poultry houses. This is also true for the application of rodenticides. A simple but effective rodent control program should also be in place.

### Temperature, air quality and humidity

Early in the life of the chick, it does not have fully developed metabolic processes. This results in their inability to regulate their own temperature. At that point, chicks are dependent on the ambient temperature

to maintain their own body temperature. Research has shown that the optimal body temperature of the chick is between 40.0 and 41.0 °C, and that chicks develop the ability to maintain their own body temperature only at around 12 to 14 days of age. With this in mind, it is a must that chicks must be provided with the proper temperature. Those brooding on the floor or litter, correct floor and litter temperature is vital to the chick's survival. In most parts of the world, radiant heaters and space heaters are commonly used. These types of heaters can be regulated according to the desired air and floor temperature. Thermometers should be placed inside the brooder area away from the heat source and at chick level. The temperature should be regularly monitored and recorded. Infrared thermometers can also be very useful in monitoring the floor temperature. Even today, for small- to medium-scale poultry farms, fuels such as charcoal are still being used as a source of heat. As long as they are able to provide the correct amount of heat and there is no accumulation of unwanted gasses inside the brooding area, their use is still acceptable. One common mistake is to keep the brooding area tightly shut in order to conserve the heat, without taking into consideration the minimum ventilation requirements. The accumulation of gases like carbon dioxide, carbon monoxide, ammonia, and others can have very serious and even fatal effects on the chicks.



Proper minimum ventilation is therefore a must. In order to ensure that there is no accumulation of these gasses.

## Minimum requirements for house air quality

In monitoring the body temperature of young chicks, one device that can be very useful is the modern ear thermometer. It is used by gently placing the ear thermometer in the bird's cloaca to get the temperature reading. Obtain the body tem-

O <sub>2</sub>	over	16 %
CO <sub>2</sub>	under	3 %
CO	under	40 ppm
NH <sub>3</sub>	under	20 ppm
H <sub>2</sub> S	under	5 ppm

peratures from a considerable number of chicks distributed throughout the house. A good guideline would be proceeding as one would do during sample weighing of the chicks to get the necessary uniformity. Readings can be taken every two hours during the first eight hours, and then adjust accordingly. As mentioned earlier, the optimal chick body temperature is between 40 to 41 °C.

The adjustments to the amount of heat provided should be based not only on the readings obtained from the thermometer, but also on the behavior and distribution of the chicks. A uniform distribution of the chicks inside the brooding area is desirable. Extreme temperatures



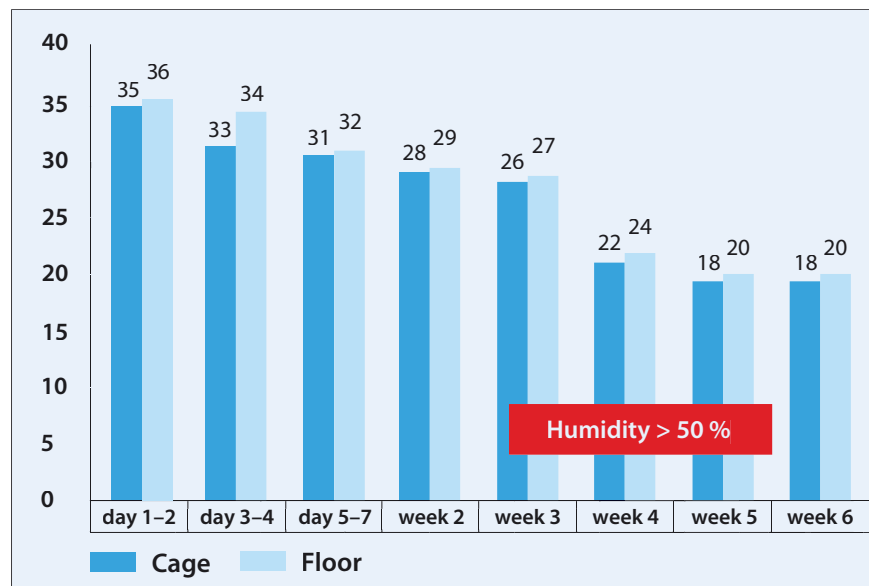
which result in chilling or overheating of the chicks will have detrimental effects. It can lead to poor growth, high susceptibility to diseases, and eventually, death. Humidity also plays an important role in brooding. The optimum level for chicks should be maintained between 50 to 70% relative humidity. In one of her articles, Fairchild states that dusty conditions in the poultry house are associated with a relative humidity of below 50%, and that a relative humidity of 70% and above provides environmental conditions that encourage microbial growth in the litter.

## Feeding and crop check

Feed should be available to chicks as soon as possible after their arrival at the brooder house. There are now products in the market that can be fed to the day-old chicks, even when they are still in the hatchery before delivery to the farm. The rationale behind this is to activate the enzyme system of the chicks as soon as possible, as possible, which will help in the faster



activity that a poultry manager can perform is checking the fullness of the crop – also known as a crop check. Feeling the crop of a considerable number of chicks at certain intervals during the day will give a fairly good impression of the wellness of



resorption of the yolk. Most of these products have a high moisture content, which also helps prevent chick dehydration. Aside from monitoring the temperature and behavior of the chicks, another important

the chicks. Chicks should have good, full crops that are not too hard or too soft. A crop that feels full and hard means that the chicks lack water. This may mean that the water founts are not sufficient in number

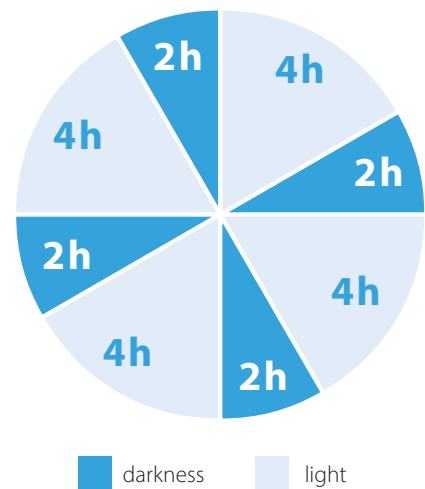
or that the nipple drinkers are not working properly. If the crop is too soft, it means that the chicks are not eating enough. This indicates that something could be wrong with the feeding management. For example, there may not be enough feeders, the chicks might be having problems extracting the feed from the feeders, or the particle size of the feed may be too big for the chicks. Insufficient floor space should also be considered as a cause of poor crop fill, and adjustment should be done accordingly. Crop check could be done together with the rectal temperature check of the chicks. A good gauge is that 80% of the chicks should have a good crop fill 8 hours after chick placement and 90%, and above within 24 hours after placement.

## Intermittent lighting program

In the management guides of H&N International, use of an intermittent lighting program for chicks is mentioned. It is a program wherein the lights are turned on and off at certain intervals. At the hatchery, chicks have been processed and handled quite intensively. For layer DOCs, vaccina-

tion, sexing and quality checks are done in the hatchery. Often times, the distance between the farm and the hatchery is long and therefore the long travel time for the chicks is also a factor to consider. The common practice is to provide light for 24 hours for the first 2 to 3 days after arrival at the farm. The purpose of this is to give the chicks enough time to eat and drink. However, during this time, not all the chicks are eating and drinking and some chicks tend to sleep and rest. When the activity of the chicks is irregular, poultry managers tend to have a hard time interpreting the behavior of the chicks. With an intermittent lighting program, it will help synchronize the activity of the chicks. This program would help to stimulate the chicks to eat and drink through group behavior. It will further aid the farmers in assessing the condition of the flock. It is also important to note that sufficient light intensity is a key factor during the first week of life. This will help the chicks to locate feed and water easily. The idea is to give the chicks a short period to rest so they can adjust to the new environment at the farm before starting with the intermittent lighting program. In this program, the chicks will be

given four hours of light followed by two hours of darkness throughout the day.



The program can be used for up to 7 to days after which, for layer pullets, the regular step down light program can be put into place.

*Dr. Gilbert R. Cervantes*

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# CHIEL TER HEERDT, the new Marketing Director at H&N



On January 1<sup>st</sup> 2015, Mr. Chiel ter Heerd M.Sc. was appointed the new Marketing Director at H&N International GmbH (H&N). Mr. ter Heerd is responsible for the global Marketing activities both at H&N International and LOHMANN TIERZUCHT GmbH (LTZ) .

Mr. Ter Heerd (39), has gained a broad experience within the layer sector of the poultry industry over the years. After completing his masters in International Business, he started his career in 2002 as a Sales Manager at Hatchery ter Heerd in the Netherlands. For the last seven years, he has been active in this family-owned company as a Commercial Director and he is still one of the main shareholders of the company.

Ter Heerd: "I am very pleased to work for one of the world's leading companies in the layer industry specializing in the genetics of layers and with colleagues who are fully dedicated to working on very high standards. Owing to my experience of working with the breeds of the company, I have been able to witness outstanding results and great laying performance of the birds.

H&N's Managing Director Javier Ramírez adds: *"We are delighted to welcome Chiel as our new Marketing Director of H&N. We are sure that his profound knowledge of the international egg layer industry together with his entrepreneurship and marketing skills will enable him to further develop the continuous success of our companies."*

## **H&N INTERNATIONAL ACADEMY** **23RD-27TH MARCH, 2015**



The 2015 H&N International Academy (formerly known as the H&N School) will be held March 23 to 27 in Cuxhaven, Germany. H&N poultry management specialists will present topics focusing on breeder and commercial layer management, incubation and nutrition. As special topics, vaccination programs and procedures for parent stock and layers will be discussed. Furthermore the academy will focus on diseases challenging the poultry industry and their prevention. Recognizing that significant numbers of H&N breeders and commercial layers are housed under tropical conditions, there will be a focus on hot climate management. There will also be a presentation addressing the importance of drinking water. Troubleshooting flock performance problems and control of red mites will be discussed as well.

H&N's geneticists will present an update on progress and perspectives for future improvements in H&N product quality based on genetic research. There will also be a visit to Kwetters, a leading Dutch egg packing station in Ede, Netherlands. Time will be made for social events as well. All indications point to success for the 2015 H&N International Academy.



# Imprint

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