

GenomChicks® — always a step ahead

Genome wide marker-assisted selection has become a standard in cattle breeding and will be so in chicken as well.

Breeders routinely select bulls from an insemination catalogue according to genomic breeding values. This genomic selection has been proven and leads to an increase in the performance rate in dairy cattle. With a large number of markers, i.e. up to 500,000 per animal, genetic estimations can now be reliably predicted regardless of age. The markers are distributed throughout the entire genome



Source: Affymetrix UK Ltd.

of the animals thus enabling reliable results as all relevant breeding traits are available.

The maximum number of saleable eggs produced per hen housed particularly determines the commercial success of laying hens. This is achieved by combining high laying performance with commendable vitality and is therefore our primary selection criteria in the selection of genetic stock.

During the last ten years, no other competitor has managed to achieve anything close to the good shell stability of the laying hens at LOHMANN TIERZUCHT.

All the competitors spend their efforts propagating on an extension of the production cycle thereby forgetting that it is the shell quality and not the laying rate which determines the optimum production period of a

LOHMANN ...Editorial

Dear readers,



The challenges are growing, but so are the chances. High and further increasing feed costs are a worldwide issue. When looking back at the past twelve months, one must state that prices for components or feed mixtures have increased by approximately 30 percent. And if forecasts are to be believed, we have to adjust to rising raw material costs, also in the long term. The reasons for this development are the growing worldwide consumption as well as production restrictions due to ecological ambitions especially in the European Union, which additionally reduce the global supply.

The steadily rising demand for high quality food in order to feed the world's population is the chance for our product: the egg. Since the feed efficiency of a layer is significantly higher as compared to that of the red meat producers, cattle and pigs. Moreover, the nutritive value of one single egg is equivalent to the nutritive value of 120 grammes of red meat. If the consumption of drinking water and the CO₂ balance are also taken into account, this advantage will be intensified considerably once more. Thus, our egg has a positive and promising future ahead!

Sincerely yours,
Hinrich Leerhoff

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flock. Those who do not have shell stability under control should not be promoting a longer and most of all, unrealistic production cycle without moulting.

In addition to the exact measurement of shell stability by means of different methods and in different stages of a production cycle, the real emphasis in breeding targets has a decisive effect on the annual improvement rate. These comprehensive phenotypic measurements of the quality parameter at LOHMANN TIERZUCHT will now be supplemented by genomic markers.

The most promising males, as based on the performance, behaviour and quality parameters, can now be selected already in the rearing period before sexual maturity. Since the measurement of late egg quality can only take place after the reproduction of pedigree hens, the application of markers for genomic selection contributes to a substantial advantage in precision and can be simultaneously applied for all persistency traits even earlier. Genomic selection is only possible when different parameters to describe egg shell stability in a breeding programme have been measured in numerous birds over several generations and stored in a large database.

For more than ten years now, LOHMANN TIERZUCHT is the first breeding company which utilises equipment for the measurement of dynamic stability in eggs in its breeding programme. Research was carried out in close collaboration with scientists from Belgium and Scotland and developed for practical use. If competitors were to now advertise that they have been using these equipment, this would only be a copy of the recording methods which have been applied at LOHMANN TIERZUCHT years ago. As the breeding progress cannot be achieved exclusively in a single generation but is based rather

on the results of a continuing and rising process, the disadvantage in terms of time must first be regained. This is even more difficult when the levels of the own lines have been lower so far. Since all other strains have been performing remarkably poorer up until now, catching up will be even more difficult since new and even better recording methods at LOHMANN TIERZUCHT are already being further developed.

Elaborate analyses of the vitality of individual outstanding families have led to the identification of especially meaningful markers in different strains. With the aid of the same, it is now possible to sustainably improve the performance stability of the next generations.

With this selection and product campaign, GenomChicks®, LOHMANN TIERZUCHT will yet again set a mark in terms of applied research and the rapid implementation in breeding practice. A further milestone in the breeding of laying hens will definitely be imitated again in other breeding companies, but this will only be a copy.

The first parent stocks of white as well as brown layers from the programme GenomChicks® will be available in spring of 2013. These will be introduced at the VIV Asia Show in Bangkok and offer tested quality for performance-based pro-

GenomChicks® a practical application of Synbreed



Synbreed:

Synergistic Plant and Animal Breeding Network of excellence for interdisciplinary, genome based research in plant and animal breeding. This study was conducted within the framework of the AgroClustEr Synbreed (FKZ 0315528C). The project is a funding programme coordinated by the Project Management in Juelich, Germany, and supported by the Federal Ministry of Education and Research (BMBF) in Germany.

ducers with different management and production systems in the future – from cage-housing to floor and free-range management all the way to very demanding organic housing. All breeding hens and cockerels are genomically pre-selected and will provide the best egg quality and above average vitality as well as top performance for all laying hen owners.

Prof. Dr. Rudolf Preisinger



LOHMANN BROWN

LOHMANN BROWN-CLASSIC profitable at Siroy Farms, Thailand

The climate temperature in South Thailand is over 30 °C from February to October, with a relative humidity of 80 – 87 %. In the hottest season, i.e. from February to May, the temperature reaches up to 34 °C and above. Owing to the subsidies provided by the local government, egg producers have combined closed-type houses with cooling-pads and tunnel ventilation to create more safe and comfortable environmental conditions for layers.

The Avian Influenza (AI) epidemic which broke-out in 2004, was a disaster for the poultry industry in Thailand. To prevent AI virus contamination from wild birds, the Thai government encouraged egg producers to change their layer houses to closed ones. These changes have not only improved layer management in Thailand but also increased the production per hen housed. The performance of LOHMANN BROWN (LB) was also pushed to a much higher level as a result of this.

- 1. Long peak persistence, 90 % above the usual level at eight months**
- 2. Get more profit because eggs which are larger can be sold at a higher price**
- 3. Consumers like the colour of the LB shell**
- 4. Good shell quality even at 80 weeks of age**
- 5. Larger eggs, i.e. above 65 g, are easy to sell when the market is depressed**

"Being an egg producer for 25 years now, we made the most profit in the years following the AI epidemic as quite a lot of other layer production farms were affected", Mrs. Judhaman said, "Fortunately, we changed from Hisex to 100 % LOHMANN BROWN four years ago which helped us to make more profit". "We are very proud of LOHMANN genetics and thank Betagro (an LB hatchery) for their support." Most exciting at Siroy Farm is that one the LB flocks had a production level



The house on fish pond



Feed residue and droppings fed to fish

of 90 % for ten months straight at 51 weeks of age. Interestingly, the house with this flock is built on a fish pond. From this combination, they even got an additional source of income from the fish harvest, which is fed by the feed residue or droppings from the layers.

David Lin



The Boonsang family

The Boonsang family has been managing Siroy Farm in the Ang Thong area (120 km away from Bangkok) for 25 years now. With a capacity of 100,000 layers, Siroy is considered to be only a medium-sized farm in Thailand.

Mrs. Judhaman (as seen in the picture) summarizes the advantages of LB as follows:

Items	Flock 1	Flock 2
Housed layers	15,264	27,487
Laying dates	Jan 26,11 – June 1,12	May 1, 11 – Aug 25, 12
Weeks in laying	70	69
Weeks of age	90	89
Mortality %	7.3	7.0
Weeks of 90 % prod	31	26
Egg numbers/HH	412	393
Profit/HH (IOFC)	500 Baht (Euro 12,40)	406 Baht (Euro 10,07)
Average egg price	2.80 Baht/egg	2.70 Baht/egg
Average feed price	12 Baht/kg	12.5 Baht/kg

100 Baht = 2,48 Euro


www.broederijterheerdt.nl

LOHMANN distributor builds new layer hatchery in the Netherlands

Hatchery ter Heerdt is the exclusive distributor and franchise hatchery of the LOHMANN layer breed in the Netherlands since the beginning of 2012.

They provide approximately 40 % of the day old chicks and pullets in the Netherlands. In addition, they have customers in Germany and Belgium.

Hatchery ter Heerdt celebrated their 75th anniversary in September 2012. The founder of the company was Mr. Willem ter Heerdt, the grandfather of Chiel and Niek ter Heerdt, two of the current owners. Mr. Symen van

layer breeding. Hatchery ter Heerdt now has a team of experts to supply the customers a complete package with all the know-how which the modern poultry farmer needs. Besides, they also developed an online web-based programme where the pullet customers can, with the aid of personalized usernames and passwords, check on the weekly updated information of the flocks in rearing. This is a very innovative method and provides an actual, fully transparent insight view to the customers of their pullets in rear at the rearing farms. Hatchery ter Heerdt works with 75 contracted pullet growers.

In the summer of 2012, Hatchery ter Heerdt opened a brand new hatchery. The new turn-key hatchery, equipped with technology from the Dutch-based incubator supplier HatchTech, has an initial annual production capacity of 9.2 million layers, although the current building, cooling, heating, and ventilation equipment was actually designed for a future production of 15 million layers in total.

The automation in the new hatchery is supplied by Prinzen Machines and Viscon, both from the Netherlands. Besides this, Hatchery ter Heerdt is custom hatching at a hatchery in Southern Netherlands. Both hatcheries are equipped with Novatech Infrared beak treatment and vaccination machines.

Together with his team, the Hatchery and Technical Director, Mr. Niek ter Heerdt, worked on the plans for the new hatchery facility for almost three years. The hatchery has been in operation for six months now and from the beginning onwards, the results have been very satisfying. They are very pleased with the hatchability rate and the quality of the day-old chicks which boasts a very low mortality rate in the first week. They see a huge improvement compared with other breeds in former time, also in the other custom hatchery. This has to do with the unique laminar airflow system in the setters and hatchers which assures an ideal environmental condition in which every embryo in the incubator is kept at the optimal temperature for outstanding development. Another unique feature in the hatchery is the HatchTech CyClean. With the CyClean which is located in each hatcher, 95 % of the fluff which usually leaves the hatcher can be captured in the machine. This results in a much cleaner exhaust air, significantly reducing the chances of cross-contamination in and around the hatchery.

Pieter-Jan Luykx



Setter at Hatchery ter Heerdt

de Velde is the third shareholder. Together with Mr. Chiel ter Heerdt, he is responsible for the daily and commercial management for the company which is located in Babberich, a small town in Holland near the German border.

In the early sixties, the father of Mr. Chiel ter Heerdt and his brother chose to specialize in



Overview of HatchTech hatcher cabinet at Hatchery ter Heerdt

Poultry production in Nepal – challenge or opportunity?

The history of commercial poultry production in Nepal is not a very long one, but birds have been traditionally raised in backyards for meat and eggs for ages.

Selected dual purpose pure line birds were introduced through a government programme about 50 years ago. About 35 years ago, modern hybrid birds were introduced. Big developments in the poultry sector have been observed in the last one and half decades.

With the inception of commercial farming, the poultry business has emerged as one of the major sources of income and has rapidly generated growing enterprises. However, it is still a long way from present conditions to rear poultry in a scientific and professional manner to generate profitability where threats by different kinds of diseases and continuously increasing feed costs not only just narrow the profit margin, but also cause losses.

According to industry sources in Nepal, the per capita consumption is only 46 eggs per year which is far below the average of 120 eggs for Asia. Therefore, there is a scope of increase of the market size by three folds which is only possible with modern methods of farming.

Modern methods of farming can not only improve the present growth pattern of the poultry industry, but also keep the prices of production under control and hence, contribute to an increased demand of poultry products, due to the affordable prices and rising consumption of the population. With the rising demand for poultry products and existing farmers expanding their operations, new investments are also on the rise. There are one billion Nepalese Rupees (NPR) in the pipeline for investments in the coming year in different parts of the country.

As a natural rule, the increased poultry production is also facing a lot of challenges with pathogen and disease load, high feed cost as well as unorganized markets. To convert this challenge into opportunity, one LOHMANN franchise hatchery, National Breeders Nepal (P) Ltd. is constructing new sites with climate control, automatic feeding, automatic egg collection sheds and fully all-in all-out facilities. This kind of facility will be the first of its kind in the Nepalese poultry industry. National Breeders

Nepal (P) Ltd. is focusing to get the best productivity from parent stock flocks and supply best quality chicks, which will cumulatively benefit competitiveness and the bottom line of its own operation as well as egg producing farmers. This trend is expected to be followed by other operators too.

Dr. Tilchand Bhattarai, President of Nepal Poultry Entrepreneur Forum and Managing Director of Pancharatna Feeds Pvt. Ltd., said that the number of commercial layers is also projected to go up by 24 % to 5.7 Mn from the present 4.6 Mn. However, the production of eggs is expected to go down to 1.11 pieces due to the shortage of layer chicks, which is being attributed to drops in the parent stock chick population by 5.7 % to 86,000, in view of the recent price hike in raw materials, low imports and diseases, all of which, have also threatened the poultry industry of Nepal. Despite all those facts as well as regular power cuts and adverse climatic conditions, the country's poultry sector has registered an impressive growth of 24 % and records a turnover of NPR 41 billion rupees in the fiscal year 2010/2011.

I would like to take the opportunity to thank Mr. Tanka Dhakal, (Managing Director Brown Bird Hatchery Pvt. Ltd.), Dr. Tilchandra Bhattarai (Managing Director Pancharatna Feeds Pvt. Ltd.), Mr. Kapil Khanal, Mr. Tikaram Adhikari (National Breeders Nepal (P) Ltd.) and all the commercial farmers for their continuous support in making LOHMANN BROWN No. 1 in Nepal.

Dr. Manoranjan Sharma



Parent stock facilities in Nepal



100 millionth chick sold in UK by LOHMANN GB

Meeting the market requirements is the central aim for LOHMANN GB as it eyes further expansion.

In November 2012, LOHMANN GB hatched its 100 millionth chick at the Millennium Hatchery near Henley-in-Arden.

Formed as a partnership between Poultry First (formerly Ross Poultry) and LOHMANN TIERZUCHT in 2001, the company had sole responsibility for marketing LOHMANN layers in the UK and the Republic of Ireland.



LOHMANN GB's Managing Director Mr. David Scott

In 2008, Poultry First's shares in LOHMANN GB were bought out by its current director, Mr. David Scott. The result was a more in-

tegrated layer production and distribution outfit.

At that stage, the company's two main breeds, the LOHMANN BROWN-CLASSIC and the LOHMANN BROWN-LITE, enjoyed a 27 % share in the UK market with 8.4 million day-old chicks sold that year. This year, LOHMANN GB will have a market share of 40 %, selling 12.8 million day-old chicks. "This sales growth is a reflection of our birds and the level of technical support we offer our customers", according to Mr. David Scott. "None of our field staff are salesmen as such, they all come from production backgrounds."

"LOHMANN birds offer both shell quality and persistency", says Mr. David Scott. "Maximising the number of saleable eggs is our mantra, not just maximising the total number of eggs. So shell quality really is the key."

Over the past four years, there has been a steady growth in the sales of LOHMANN BROWN-LITEs. "The LOHMANN BROWN-LITE was introduced in 2008 with the aim of supplying medium eggs to the colony market," says Mr. David Scott. "But the breed has been popular on free-range units too, and now over a third of our chick sales are that of LOHMANN BROWN-LITEs." This fits the current market requirement with more demand to value and medium eggs.

All LOHMANN GB birds come in as day-old parent stocks, having been hatched from



grandparent stocks by LOHMANN TIERZUCHT in Cuxhaven. They are placed on breeding farms throughout the Midlands and Southern England, some rented, some owned and some on contract. "Having a mix of farms gives us flexibility. If order volumes change, it is easier to make ad-



Presentations during Road Tour 100.000.000 DOC by LOHMANN GB and LOHMANN TIERZUCHT

justments on our own breeder units". The fertile eggs are then transported to the Millennium Hatchery where LOHMANN GB has a custom-hatch agreement. The day-old chicks are dispatched to commercial layer units, having been infrared beak treated and vaccinated for Infectious Bronchitis and Marek's disease. Nowadays, LOHMANN GB operates as a franchise for LOHMANN TIERZUCHT, covering the whole of the UK and the Republic of Ireland.

Pieter-Jan Luykx

“Troubleshooting in the hatchery” – how to perform an egg breakout?

Breakout analyses are useful hatchery management procedures that provide valuable information by helping to relate problems to the breeder flock, egg handling procedures and/or the hatchery.

There are three different procedures for breakout analysis that can be implemented by a quality control employee. Each of the methods has advantages and disadvantages. The data recorded should be used to continuously control the production procedures and aid in finding room for improvement. If a database has been built up, it can be used for quick and precise troubleshooting should problems occur.

Fresh egg breakout

The quickest way to estimate the fertility in a breeder flock is a fresh egg breakout. The eggs can be cracked open just after lay or upon arrival at the hatchery. The disadvantages of this breakout method are the loss of valuable hatching eggs and possible errors of prediction due to the relatively small sample size (usually 100 eggs per flock). It is therefore recommended to limit the use of a fresh egg breakout to situations where a quick fertility check is required.

- Planning the first setting of eggs from a young flock.
- Problem flocks.

Infertile and non-incubated fertile eggs can be differentiated quite precisely after some practical training. Guidelines and pictures can be found in the Hatchery Management Guide of LOHMANN TIERZUCHT, which is available upon request.

Candling breakout

The candling breakout analysis offers the highest accuracy in determining fertility. It

is also useful in recording other sources of breeder flock or egg handling failures such as, early mortality, cracked eggs or eggs set upside down. It is therefore a good tool to monitor the week-to-week status of the breeder flocks.

Additionally, the candling percentage allows quite a precise prediction of the expected hatch of saleable chicks. As candling is usually done at days 9–10, there is time to react (e.g. rearrange settings, re-schedule shipments and to detect causes and find solutions to the same) if a high number of clear eggs is observed. The size of the sample should be four to six trays of one flock (at least 600 eggs) from different locations inside one setter. This sampling procedure is not only important to avoid biased results caused by incubation conditions, but also by farm conditions. The eggs on subsequent trays might be of different quality than the average of one farm.

Hatch debris breakout

Most often performed in hatcheries is the breakout on hatch days which is also known as hatch debris breakout. Although it gives a full picture about the pattern of embryo mortality, infertile eggs and those containing early dead embryos are more difficult to distinguish. Another disadvantage is the time delay of usually four weeks (three weeks incubation + one week storage) between the date of lay and the breakout. A hatch debris breakout should be done every hatch day or just monthly in order to build up a database.



LOHMANN TIERZUCHT Hatchery Management Guide

- To perform a hatch debris breakout, one should take out four to six hatchery baskets of one flock from different positions in one hatchery.
- Remove all unhatched eggs and place them on pulp trays.
- Record the number of dead chicks and culls left in the basket.
- Classify the unhatched eggs into appropriate categories, as Infertile, Early dead (day 1–7), Mid-dead (day 8–17), Late dead (>18), Pipped and Contaminated.
- Additionally, the eggshell should be assessed and cracked eggs also recorded.

Continued from page 7

As already mentioned, the differentiation between infertile eggs and very early dead birds is difficult as the blastodisc is often undetectable. One therefore needs to assess the appearance of the yolk and the albumen. If the egg still looks like a “table egg” on the day of hatch, it was most probably infertile. If you deal with very early dead germs, the colour of the yolk will change slightly, yolk membrane will weaken and the albumen will be thinner.

The content of eggs containing embryos which died during the second week of incubation will often appear black due to the breakdown of blood. Be careful not to classify these eggs as contaminated as long as they do not emit an odour. If breakouts are done regularly with an adequate sample size, the use of more categories (day 1–2, day 3–4, Malformation, Malposition, Internally pipped, Pipped alive vs. dead, etc.) can provide additional information, which might be overseen when using a more simple approach. All results from breakout analyses should be expressed as percentage of the eggs set, e.g. for three early dead chicks in a tray of 150 eggs, the result would be 2 %. The breakout data should be analysed using standards based on the results of the individual hatchery. From time to time, the standards should be compared to results achieved in other hatcheries. If you notice elevated percentages in single categories, have a look at the appendix of the

Hatch debris Breakout sheet							Hatch date: _____
Tray No	1	2	3	4	5	6	Remarks
Flock No/ Age							
Hatcher No							
Tray Position							
Egg storage days							
Crak'd / Thin shell							
Contaminated							
Infertile							
Early I: <48h							
Early II: Blood Ring							
Early III: Black Eye							
Mid: 8d - 17d							
Late I: Turned							
Late II: Air Cell							
Deform/abnormal							
Malposition							
Upsidedown							
Pipped, dead							
Pipped, alive							
Cull chicks							

Example of a detailed hatch debris breakout sheet

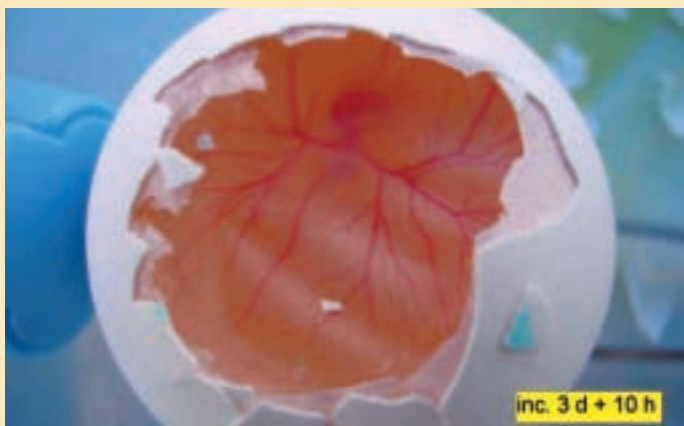
LOHMANN TIERZUCHT Hatchery Management Guide where you will find a comprehensive list of probable causes. The Technical Service Team at LOHMANN TIER-

ZUCHT is available to assist you with the set-up of a breakout routine and/or by the interpretation of the results.

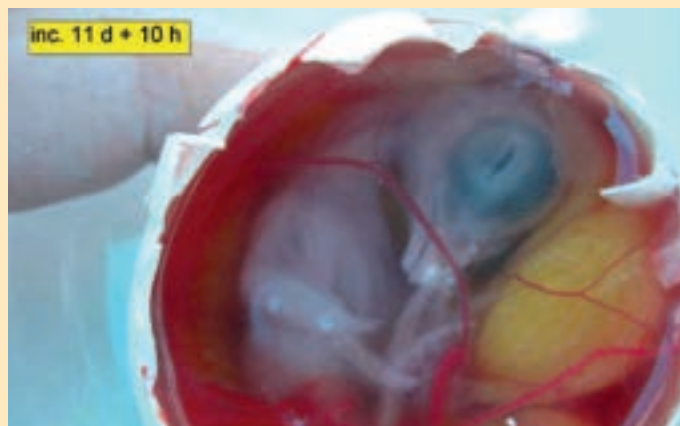
Robert Schulte-Drüggelte

Troubleshooting and breakout rules:

1. If a problem occurs, check the basic farm, transport and hatchery procedures first.
2. Collect breakout data regularly – also from good hatching flocks – to create your own database. Keep the records simple enough. You need to work with them.
3. Do not take action just because of the results of one breakout. Check the same flock again incubated in a different machine or vice-versa.
4. Assure good communication along the production chain, especially between the breeder farms and hatchery. This may not prevent problems, but significantly minimise their economic impact.



Embryonic development at day 3 + 10 hours



Embryonic development at day 11 + 10 hours

Two new hens at the start: LSL- and LB-CONVERTER

Conservation of resources and sustainability – two issues, which are becoming more and more important against the background of a growing world population.



Economy, science and environmental protection organisations are discussing the big task of the future: to supply the world

In this context, an even more efficient layer in terms of an improved feed conversion, mirrors these ongoing discussions. The

percent of the complete selection potential is available for distribution to the individual characteristics. In order to achieve the main goal of an improved feed conversion, which is the ratio of kilogram feed required per kilogram egg mass produced, a minor reduction in body weight of the CONVERTER lines was accepted. A reduced body weight decreases the maintenance requirement of the layers and contributes considerably to the improvement of feed conversion. Percentagely more feed is available for the layers in the production of egg mass. Due to the stronger emphasis of feed conversion in the selection index, there is an unfortunate as a side effect of having a slightly lower genetic progress in terms of laying performance and egg weight. However, no cutbacks in breeding were made where viability was concerned.



Capturing individual feed intake in the pure lines

population with sufficient animal protein and at the same time, to solve distribution problems in food provision. Experts assume that the demand for animal foodstuffs will double by the year 2050. Thus, high performance as well as good efficiency of the livestock are important preconditions for feeding the world population. The limited reserves of agricultural areas require the highest possible generation of animal protein per hectare of agricultural area, whereas the production of eggs represents one of the most efficient ways in achieving that goal.

LOHMANN LSL- and LB-CONVERTER should fulfil this task. Both layers are sub-lines of the well-known LOHMANN SELECTED LEGHORN (LSL) and LOHMANN BROWN layers. For several years, the breeding of these birds mainly targeted an even better feed conversion. However, this does not mean that all other selection criteria are disregarded. The challenge for the breeder lies rather in the new adjustment of the selection index. More than 20 different performance, quality and behavioural characteristics have to be evaluated anew. This is due to the fact that also for the CONVERTER lines, "only" 100

Chart 1 shows the new laying performance standards of LSL- and LB-CLASSIC and CONVERTER at 72 weeks of age in a cage system. Here, the advantages of CONVERTER layers as compared to CLASSIC lines are obvious: better feed conversion due to lower feed intake and lower body weight, although the figures also indicate that CONVERTER layers do not achieve the maximum possible egg mass production. When choosing a suitable layer, environmental conditions are crucial. Markets billing according to kilogram egg mass and not to egg quantity could obtain an economic advantage with the CONVERTER lines, as higher egg weights would be awarded additionally when billed according to egg mass, i.e. provided that the feed is always of good quality!



Continued from page 9

If the feed quality is below average, neither CLASSIC nor CONVERTER layers will be able to achieve the standard performances listed below. Countries which cannot cover their own requirements of raw materials for feed and thus, have to import feedstuff, could counteract the high-priced feed market by means of the more feed efficient CONVERTER lines. Compared to the CLASSIC lines in egg production, 60 respectively 90 g of feed per kilogram egg mass can be saved with the CONVERTER lines.

Besides egg number, egg weight and feed efficiency, the hens' body weight can also be decisive for choosing a suitable layer. Especially in markets in which profitable prices are still obtained for spent hens, a deduction of 100 g in body weight could have an adverse effect on the economic success of the egg producer. Due to their reduced feed intake of 5 to 7 g, CONVERTER lines have a lower body weight. This has to be considered particularly under suboptimal housing conditions. Neverthe-

less, good management and good feed quality provided as well as the results of a field test have demonstrated that when it comes to viability, CONVERTER lines are not inferior to CLASSIC lines.

In summary, it can be stated that due to their excellent feed conversion, LOHMANN LSL- and LB-CONVERTER layers contribute to an even more efficient usage of the scarce feed resources and to an increase in the profitability of egg production.

Dr. Matthias Schmutz and Dr. Wiebke Icken

Chart 1: Comparison of performance standards of CONVERTER with LSL/LB-CLASSIC (cage, 72 weeks)

	LSL-CLASSIC	LSL-CONVERTER	LB-CLASSIC	LB-CONVERTER
Egg number/h.h.	323	320	317	314
Feed/day [g]	110	105	115	108
Body weight [g]	1,780	1,650	2,025	1,900
Egg weight cum. [g]	62.6	62.2	63.9	63.3
Egg mass [kg]	20.2	19.9	20.3	19.9
Feed conversion [kg/kg]	1.98	1.92	2.07	1.98

The impact of laying pattern characteristics on egg quality traits

Introduction

The genetic potential of layers today is sufficient to produce a high quality egg on more than 100 subsequent days. With a programme of 16 hours light per day, such big clutches require time intervals of around 24 hours. Shortened time intervals as well as fewer days without any oviposition between two consecutive laid eggs are the last but not least consequences of improved laying performance. However, this development in the cyclic nature of a hen may not take place at the expense of egg quality. Therefore, eggs from hens with varying oviposition intervals were tested for this study to determine the influence of the reproduction cycle length on egg weight, breaking strength and egg shape.

Material

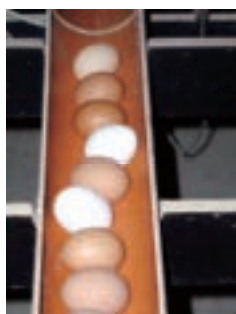


A hen leaving the Funnel Nest Box

239 pedigreed offspring of a LOHMANN BROWN line established at the experimental station Thalhausen, were specifically tested with the Weihenstephan Funnel Nest Box.

Captured traits for 1,559 eggs collected over a period of 9 consecutive days at an age of 27 weeks:

- Exact oviposition time
→ time interval
- egg weight
- egg shape
- breaking strength



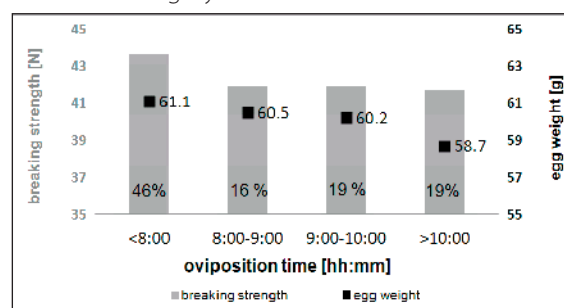
Egg collection of one nest



Egg weighing (left) and measuring breaking strength (right) of hen-specific assigned eggs.

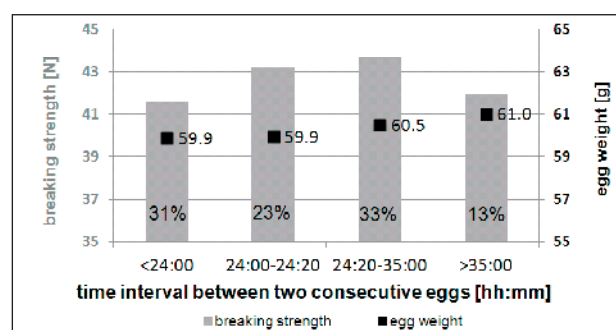
Results

Changes in breaking strength and egg weight in regard to oviposition time as well as the percentage of observations in each time category.



Eggs which are laid early in the morning are often eggs which are laid at the beginning of one clutch. These eggs are higher in egg weight and their egg shape is rounder than eggs which are laid later during the day.

Changes in breaking strength and egg weight for different time interval categories and their percentage.



Despite a small increase in egg weight, breaking strength is also higher for eggs laid after longer time intervals.

Conclusion

In regard to egg quality and other performance criteria, there is an optimum time interval of between 24 hours to 24 hours and 15 minutes. Hens which lay eggs within this time frame are the most economical layers. They are distinguished by the highest egg mass output combined with good egg quality.

Attractive eggshell colour as a breeding goal

First quality eggs must have first quality shells, i.e. they must be clean and have strong shells to withstand handling and transportation. In addition to these primary shell quality criteria and adequate egg weight, a uniform and attractive white or brown shell colour is very important to the consumer.

The consumer assesses the quality of an egg according to his specific subjective demands, and one of these demands is clearly eggshell colour. The proportion of white and brown eggs consumed in the world is roughly 50:50 with significant differences between continents in preferred shell colour (Figure 1).

Colour determination with the L*a*b* colour system

The colour of an object is determined by pigments. These are chemicals which create a given colour by subtracting parts of the spectrum of the incident light. The remaining light is reflected and this gives the



Figure 2: Reflectometer used to measure eggshell colour

- **L***: lightness (value between 0 = black and 100 = white)
- **a***: hue as a function of the red-green scale (<0 = green, >0 = red)
- **b***: hue as a function of the blue-yellow scale (<0 = blue, >0 = yellow)

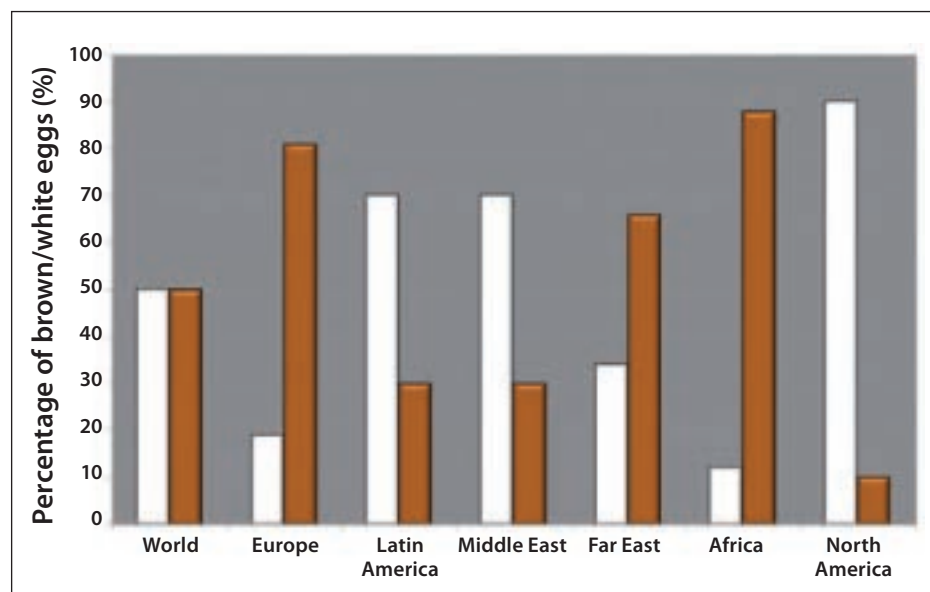


Figure 1: Estimated percentage of brown and white eggs worldwide.

Shell colour is not an indication of internal egg quality and says nothing about the nutritive value or the quality of the egg. However, many consumers who prefer brown eggs, also pay attention to the intensity and uniformity of colour. Pale or unevenly coloured eggs may be rejected. Clearly, reduced variability of eggshell colour improves the presentation of eggs at the point of sale.

object its colour. Colour is a matter of perception and subjective interpretation of the person looking at the object. When colours are classified, they can be expressed in terms of their lightness (brightness), hue (colour) and saturation (vividness). Using the Minolta device (Reflectometer CR 300, figure 2), the colour of each individual egg can be objectively determined by the following three parameters:

To speed up selection for dark shell colour, LOHMANN TIERZUCHT started measuring eggshell colour in large numbers of pedigreed brown-egg layers with the Minolta reflectometer in the early 1990s. While subjective scores depend on light sources in the observation room and preferences of individual graders, the objective parameters are measured on a continuous scale and can be compared across locations and years and between different ages of the same flock. More important from a breeder's point of view is that the variation within a pedigreed flock can be analysed as a normally distributed quantitative trait and used for systematic selection in the direction of consumer preferences.

Eggshell colour as a breeding goal

Commercial brown-egg lines have been selected for attractive dark brown shells for many years, based on subjective evaluation and quantitative measurement of shell colour. Moderate values of heritability for eggshell colour indicate considerable



Figure 3: Range of shell colour which may be seen in unselected flocks of different pure lines (left) vs. typical variation of shell colour in flocks with good uniformity.

variation in shell colour among families and individual hens within a line. Since the breeding goal is to select for dark brown eggshells. Individuals with a breeding value for sub-standard shell colour are unlikely to be selected – unless they are outstanding in most of the other traits. The overall breeding goal is focused on a high number of “saleable” eggs, i.e. to be selected, a candidate must have positive breeding values for both egg number and egg quality, while more eggs with undesirable shell quality are least desired.

Effects of hen age on the eggshell colour

It has been reported that older hens tend to lay larger eggs with lighter shell colour. This is because the quantity of pigments deposited on the shell surface does not increase in relation to the egg size. Hence, the pigments of brown eggshells are deposited over a larger surface area as the hen ages and lays larger eggs. Results of LOHMANN TIERZUCHT pure line layers showed for a Rhode Island Red line that the eggshells became significantly lighter with increasing age, whereas a tested White Rock line still had an excellent shell colour at 60 weeks of age. The heritability estimates of all colour parameters were similar at different ages. Close genetic correlations between measurements at the different ages suggest that hens which lay eggs with a dark shell colour at peak production, will also tend to lay dark coloured eggs at the end of the cycle, indicating the strong genetic component for general shell pigmentation. If additional measurements at the end of the laying period add little to the accuracy of breed-

ing value estimation, measuring eggshell colour at an intermediate age should be sufficient to monitor and further improve lifetime eggshell colour.

New ideas to describe and improve “attractiveness” of eggshell colour

Some eggs look more attractive than others because they have a natural “shine” as if they were washed and oiled. This phenomenon can be observed in both white and brown eggs with different frequency. In Europe and other countries where washing and oiling of eggs is not permitted, it would be interesting to know whether the shine of the eggs is a heritable trait which could be used to improve the attractiveness of shell eggs at the time of purchase.

We have tested a new device (Spectrophotometer Minolta CM 600d) along with routine measurements of eggshell colour parameters ($L^*a^*b^*$). Data for the shininess of eggshells were collected for two brown-egg pure lines to estimate genetic parameters for this new characteristic. Shininess is measured by comparing the reflection from different angles. An eggshell with a value of 0 has no shine and is completely matt, and the higher the measured value, the shinier is the eggshell. In this study, the shininess of the eggs varied between 0 and 14, with an average of 2.6. The shininess was lower in the Rhode Island Red line as compared to the White Rock line. This trait had a moderate heritability and desirable genetic correlations with all three colour parameters which therefore determines shininess as a useful selection tool.

Perhaps even more interesting than aesthetic considerations would be to find a positive relation between the shininess of the eggshell and increased protection against pathogen penetration. It seems reasonable to expect that eggs exhibiting a brilliant shine are more likely to have an intact cuticle than eggs with a matt appearance. However, preliminary studies with special equipment have not confirmed the assumption that the shine on eggs also reflects an intact cuticula, which would be highly desirable in the context of food safety.

Conclusion

Improving eggshell quality is a significant objective for breeders to satisfy consumer preferences. The heritability of shell colour is moderately high which allows the breeding companies to achieve further genetic improvement in commercial layers. Shell colour in brown eggs tends to deteriorate toward the end of the laying cycle, but a close genetic correlation at different ages assures that early measurements will also improve life time shell colour. While eggshell quality is receiving a lot of attention in genetic selection programmes, egg producers should be aware of all non-genetic factors which must be controlled to satisfy high customer expectations in oversupplied markets. In addition to high quality feed and water effective control of diseases and air quality, monitoring the functioning of all equipment and special attention must be paid to frequent egg collection and egg storage under optimal conditions.

Dr. David Cavero and Dr. Wiebke Icken

Dr. Manoranjan Sharma – a new team member of LOHMANN TIERZUCHT



After an intensive training period in Cuxhaven, Dr. Sharma has taken on the role of Area Sales Manager for Bangladesh, Nepal and Sri Lanka. Furthermore, he supports the technical service department in the Asian region.

As a native Indian, Dr. Sharma fulfills his duties from India, which include the acquisition of new customers, establishing and maintaining contact with customers, providing technical support to customers

as well as monitoring the market and the competition.

Dr. Sharma has many years of experience in the fields of animal health and veterinary science. Before working for LOHMANN TIERZUCHT, he was employed as Area Sales and Technical Manager at Intervet Schering Plough Animal Health Ltd. / India.

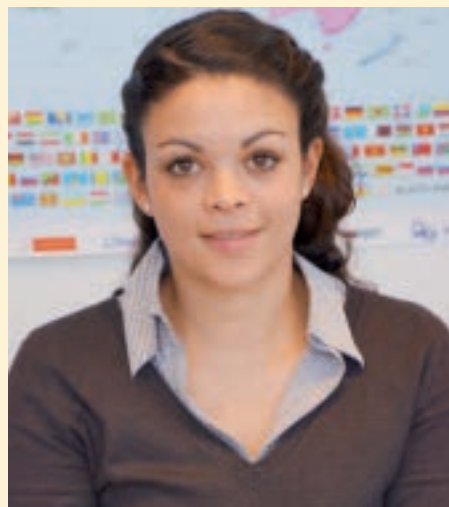
Nicole Rehse

We would like to introduce: Djanet Ould-Ali

Since mid May 2012, Djanet Ould-Ali has been supporting Dr. Hans-Heinrich Thiele and his team in the Technical Service Department.

Ms. Ould-Ali studied Agriculture with emphasis on Animal Production at the University of Applied Sciences in Osnabrueck. Already in her thesis work for her Bachelor degree, she intensively dealt with the subject of layers. During her internship in the genetic department of LOHMANN TIERZUCHT which began in May 2011, she wrote her Master thesis on egg quality parameters for LB and LSL hens where she already gained the first insights into the operations at the breeding farms as well as in the pedigree farms.

From August 2011 until May 2012, she participated in the DLG e. V. trainee programme for young professionals supported by LOHMANN TIERZUCHT. She is the first LOHMANN employee who took part in this programme. The DLG trainee programme was developed for junior employees in the agricultural business and prepares them



for future professional challenges during a nine month programme which includes two practical training periods of twelve weeks each and twelve weeks of seminar.

Since mid May 2012, Ms. Ould-Ali renders her support to the Technical Service Team.

Her responsibilities include customer support (processing all inquiries about lighting programme, feeding and management), the development of management guides, writing articles for trade journals as well as maintaining the data management system for the in-house flow of information. Additionally, she is involved in several other internal projects.

In October 2012, she graduated from the University of Applied Sciences in Osnabrueck with a degree as Master of Science in Agriculture.

LOHMANN TIERZUCHT congratulates her on the successful completion of her Master degree and looks forward to a fruitful cooperation with Ms. Ould-Ali.

Ines Borchert

More than 1,000 participants in LOHMANN events in 2012

"1,000 plus": a benchmark is set – also for the future!

During the analysis of our activities in 2012 and the planning for the years 2013/2014, we have noticed with pride that more than 1,000 attendees have participated in our customer events worldwide.

The main goal of these activities is the transfer of know-how and important information regarding the production of the food product – "the egg". There are various offers in order to respond to the requirements of our customers and their employees appropriately.

A high-quality chicken is linked to adequate knowledge. We are very aware of our responsibility towards our animals, our customers and the environment. With our events, we create a so-called "win-win-win-situation": On the one hand, our customers

and partners are winners due to the information provided which contributes to sustainable production. On the other hand, our animals are winners, as the trainings focus also on information on housing according to animal welfare, on feeding and on management. These factors in turn lead to an optimum production efficiency corresponding to the high genetic level. Thus, the environment can be considered as another winner as resources are used responsibly and in the best possible manner.

A further key aspect is the exchange of ideas with our customers, their employees and our customers' customers. For us, it is crucial to understand the situation, the challenges and the potential threats on site. Even nowadays, this kind of direct and personal communication cannot be replaced by

emails, video conferences or telephone conversations. Information obtained in such a way strongly influences our decisions and orientation: "Breeding for success... together!" – an unique concept worldwide. Based on the motto "Better is the enemy of good", we are continuously striving to improve and innovate. For that reason, your suggestions are highly appreciated.

In this context, we have launched a new event concept called "One day with.... (customer/company)" aiming at planning and executing local events together with our partners and on our part, supporting with resources. Please contact us for further information - we are looking forward to your requests. For the "1,000 plus" is set!

Hinrich Leerhoff



Brazilian Group Asunción

2012 – the year of LOHMANN seminars on all five continents

In 2012, about 1,000 attendees were trained by employees of LOHMANN TIERZUCHT and invited specialists in seminars and courses on the proper management of LOHMANN parent stocks and layers. In addition to the regular annual LOHMANN School Cuxhaven with international participation, local LOHMANN Schools were organized in Niagara Falls, Canada, in Asunción, Paraguay, as well as a US seminar in Amelia Island, Florida. In the historical Lutherstadt Wittenberg, Germany, employees and customers of the LSL Rhein-Main met for a three-day seminar on rearing and management of layers.



LOHMANN School Canada, Niagara Falls 2012

During these trainings, all issues regarding management of parent stocks and layers are addressed. However, presentations by LOHMANN experts as well as by invited specialists are not a one-sided activity. Discussions have an important part in each event and are absolutely welcome for know-how transfer in the most effective way. Even when "classes" are finished, the participants continue their talks and exchange their experiences. By means of such seminars, LOHMANN TIERZUCHT also provides a platform for sharing information within the customer base. Thus, attendees often stay in direct contact with each other for many years.



LOHMANN School Cuxhaven 2012



Hatchery Course 2012

The Hatchery Course Cuxhaven 2012 supplied experts and staff of hatcheries with up-to-date findings and information for the hatching of layer chicks. Issues regarding management of parent stocks for the production of high quality eggs were discussed as well as specific requirements for the incubation of eggs to produce layers. Traditionally, the audience followed a lecture on the embryonic development of chicken with great interest just as the presentations of innovative hatchery technology by selected manufacturers. Vaccination programmes for parent stocks and day-old chicks are essential for the production of healthy and top-quality layers. Especially in strongly developing regions such as Asia, Africa and Latin America, these programmes and those for securing hygiene and corresponding biosecurity are particularly important.

During the past year, numerous visitor groups came to the headquarters of LOHMANN TIERZUCHT in Cuxhaven to debate on subjects such as feeding, optimising of feed and the management of flocks. The design of lighting programmes for the stimulation of flocks housed in cage and barn systems respectively, not to mention free-range systems, was canvassed and the correct choice of illuminants. Additionally, recommendations for the control of egg weight were made. Major parts were talks regarding animal health and the prevention of diseases, particularly by means of customised vaccination programmes. The veterinarians of LOHMANN TIERZUCHT are recognized worldwide as competent partners and, due to the diagnostic capabilities of the veterinary laboratory in Cuxhaven, they are able to clarify manifold issues occurring in the industry.

Dr. Hans-Heinrich Thiele



LOHMANN School Latin America 2012

Sharm El Shaik Seminar 15 – 16 September 2012

Wadi Group of Cairo, Egypt organised a seminar for table egg producers in Sharm El Sheik from September 15 to 16, 2012.

Approximately 60 people from leading table egg producers in Egypt participated in the technical conference held at Mövenpick Resort.

Tony Freiji, Wadi's CEO, welcomed the audience and described the role Wadi Group is playing in the development of the Egyptian poultry industry. Dr. Matthias Schmutz presented a comprehensive paper on LOHMANN's R&D programme. Afterwards, the group enjoyed a starlight dinner in the Sinai desert with local folklore and entertainment.

The morning session on the second day focused on layer nutrition with contributions from Robert Pottgueter, LOHMANN TIERZUCHT, and Dr. Mazen El Sherif nutritionist of Wadi. After lunch, Ron Eek talked about optimal pullet growing management and presented global results illustrating the superiority of the LOHMANN LSL and LOHMANN BROWN layers. Dr. Nashat Faoud, Sales Director of layer chicks with Wadi, explained the merits of Wadi's commercial layer chick department. One of the numer-



Participants and lecturers at the Sharm El Shaik Seminar

ous activities in the Wadi Group, besides poultry, is Tabreed, which produces cooling cell pads for agricultural and industrial use. Emad Tanagho presented a paper on cooling and ventilation in poultry houses.

The seminar was completed by Musa Freiji, Chairman of Wadi Group Board, who gave

his vision on the past and future of table egg production in Egypt. After all participants received their certificates, everyone returned home with updated knowledge. This highly successful event confirmed Wadi's leading position in the Egyptian table egg market.

Ron Eek



50th International Franchise Distributor Meeting in Berlin

On the occasion of the anniversary conference held from 25 to 27 September 2012, the German capital Berlin provided a very special location for more than 250 participants from 34 countries.

Besides a diverse entertainment programme, the Franchise Distributor Meeting focused on the presentation of new products, economic aspects of agriculture as well as animal health associated with technical service. The event was opened with the welcoming speech of Hinrich Leerhoff, Managing Director of LOHMANN TIERZUCHT. Subsequently, Prof. Dr. Harald von Witzke from Humboldt Universität Berlin informed about "Increasing agricultural prices – Challenges for global nutrition and climate protection". In his presentation, he described how the development of raw materials prices is related to the continuously growing world population and thus, a steadily increasing food requirement.

Dr. Matthias Schmutz, geneticist of LOHMANN TIERZUCHT, introduced new breeding products of LTZ in his speech. In order to fulfil the demands of the world market for an improved exploitation of feed resources, specific CONVERTER lines for white and brown-coloured eggs with a particularly good feed conversion, have been developed and presented for the first time at the Franchise Distributor Meeting in Berlin.

Prof. Dr. Rudolf Preisinger, Chief Geneticist and Managing Director of LTZ, introduced another new breed. His presentation "Dual-purpose chicken for broiler farms and egg producers" addressed the current topic of

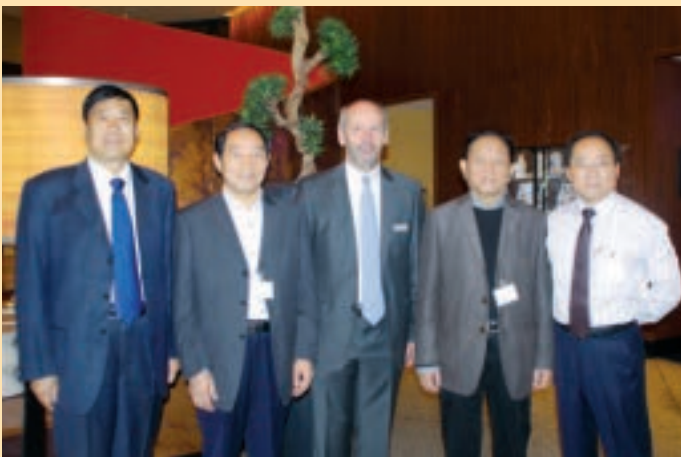
how to use male day-old chicks of laying hybrids. In this context, LTZ has developed a line combination called "LOHMANN DUAL" of which the male birds can be fattened and the females can lay eggs.

The topics on the second day covered issues related to animal health and was opened by Keiron Forbes, Agri-research (Ireland) Ltd., with his lecture "Faster Horses". He reported on experiences in the discussion with poultry farmers regarding feed costs, animal health and production efficiency of laying hens. Conditions which have to be provided by feeding in order to meet future expectations in terms of performance and efficiency were also discussed.











In the next presentation "Managing layers successfully in the United States", Chris Pierce, Heritage PMS Inc., USA, explained, from his point of view, the key aspects of successful egg production. In his lecture "Marek's Disease – still an issue or problem solved?", Prof. Dr. Klaus Osterrieder, Freie Universität Berlin, referred to the current situation and current issues regarding further research on the Marek virus as well as the application and development of new vaccine viruses.

Dr. Matthias Voss, Veterinarian and Head of the Veterinary Laboratory of LTZ, gave a general overview of future trends in poultry vaccination. He pointed out that there are

three essential directions in the development of vaccines: recombinant vector vaccines, new live vaccines and the development of new dosage forms.

Then, Prof. Dr. Henner Simianer, Georg-August-Universität Göttingen, discussed in his presentation "Synbreed: Genomic selection and breeding planning" the potential of genomic selection in layer breeding and introduced the project "Synbreed" to the audience. After the lunch break, all participants went on a three-hour guided tour of the German capital including the important sights. The programme of the day concluded with a festive dinner in the historic waterworks.

On the third day, the attendees started with a company tour of the franchise hatchery Spreenhagener Vermehrungsbetrieb für Legehennen located in the south of Berlin in Bestensee. This was followed up by a visit to the rearing area and laying units as well as the modern packing station.

The entire team at LOHMANN TIERZUCHT is already looking forward to the 51st Franchise Distributor Meeting, which will take place in Salzburg, Austria, from 30th September to 2nd October 2013.

Stella Schnor





“GCT” – “Global Competence Team”

GCT is a department of LOHMANN TIERZUCHT. To be precise: It is an enhancement of the “LOHMANN Technical Service Team”. For the first time worldwide, know-how regarding management, feeding and veterinary issues (also referred to as labor diagnosis in the field) as well as inquiries and advice concerning construction and hatchery, is now pro-

vided by one single source. Unique problems can be addressed, 360° consultancy services for existing farms and complete support in terms of expertise for projects in all parts of the world can now be provided. The customer can be assured that he will receive the support of a well-coordinated team which is able to establish a coherent production sys-



tem and thus, able to contribute significantly to the success of our customers.

The next official presentations will be at the IPPE in Atlanta/USA and VIV Asia in Bangkok/Thailand.

Hinrich Leerhoff

It is time again: LOHMANN TIERZUCHT at IPE/IPPE 2013 in Atlanta, USA

Professionals of the poultry industry from all over the world will meet in Atlanta, USA, from 29th to 31st of January 2013. After a successful exhibition in 2011, the expert team of LOHMANN TIERZUCHT is once looking forward to interesting discussions and

information exchange with the fair visitors. Furthermore, the company will present its new concept Global Competence Team (GCT) during the IPE/IPPE. We welcome you to our **booth 7519 in hall B** – See you in Atlanta!

Stella Schnor



January 29 – 31, 2013
Georgia World Congress
Center
Atlanta, GA

From Atlanta to Bangkok: VIV Asia 2013

After the USA, LOHMANN TIERZUCHT will participate in the VIV Asia in Bangkok from 13th to 15th of March 2013. Being one of the biggest Southeast Asian agricultural shows, international professionals of the poultry industry will also gather there. LOHMANN TIERZUCHT will introduce the

new concept GCT here as well. Due to the fact that the number of visitors had increased by 39 % already in 2011, thus reaching 29,000 visitors in total, a further boom is expected for 2013. For that reason, we are looking forward to inspiring talks as well as mutual exchange of know-how

and, of course, to your visit to our **booth Q032 in hall 101!**

Stella Schnor



March 13 – 15, 2013
VIV Asia 2013

Calendar

IPPE 2013,

29 – 31 January 2013, Atlanta, USA

VIV Asia 2013,

13 – 15 March 2013, Bangkok, Thailand

International Franchise Distributor

Meeting 2013,

30 September – 2 October 2013,
Salzburg, Austria

Imprint

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