

POULTRY NEWS

1/2017

INTERNAL

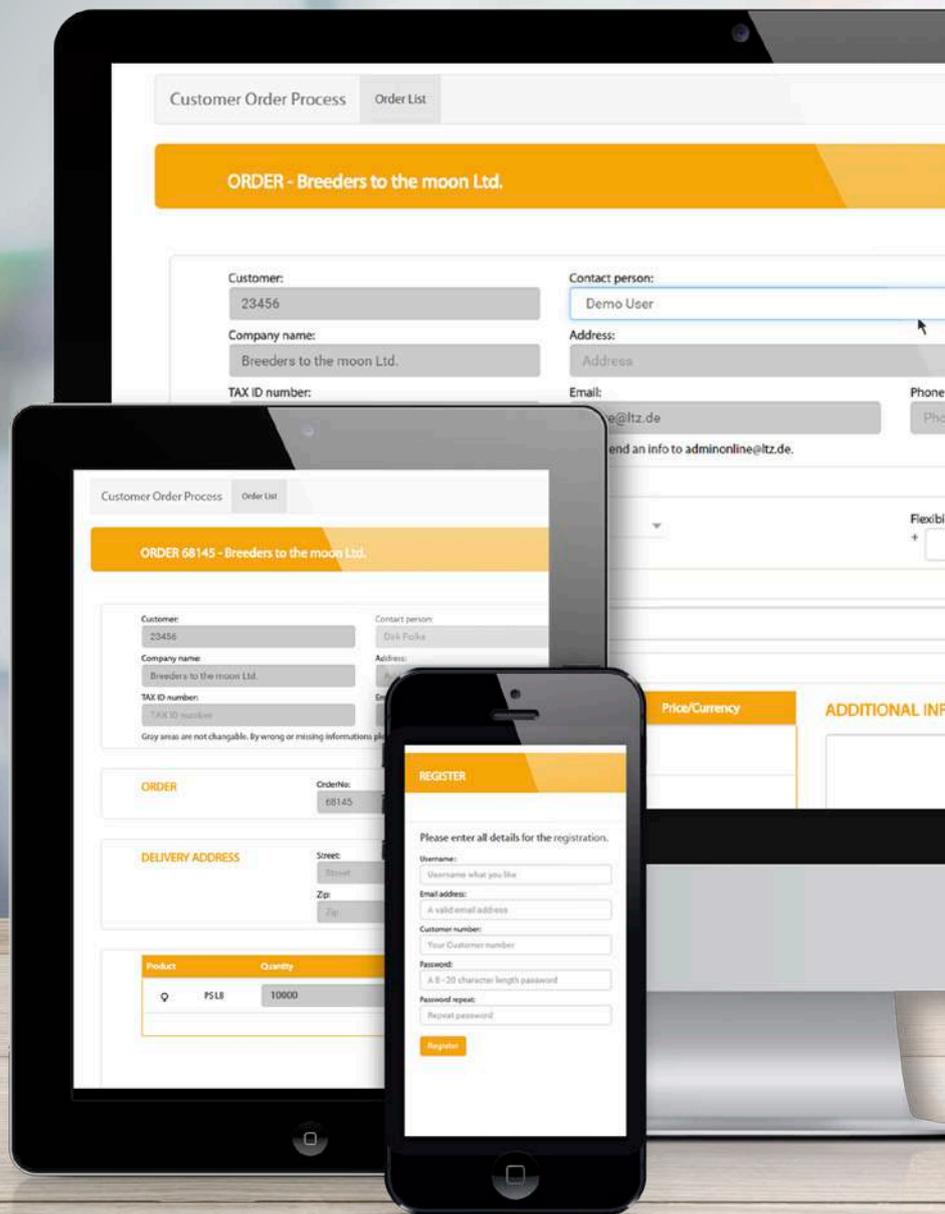
New responsibilities in the Genetic Department – LOHMANN's core under new direction

CUSTOMERS & EVENTS

New partnership between SNV and LOHMANN TIERZUCHT

TECHNICAL

Genetic and environmental effects on eggshell stability



LOHMANN ONLINE ORDERING

A TOOL THAT MAKES OUR LIVES EASIER



LOHMANN
TIERZUCHT

LOHMANN ONLINE ALL OVER THE WORLD!



The march of time is unstoppable. The advances in technology in different areas and the need to modernize outdated structures don't stop at the gates of the poultry sector. Traditional poultry farms are developing into modern poultry companies and as the world's leading poultry breeding company, we have to keep up with the times in order to satisfy the new expectations.

LOHMANN TIERZUCHT has developed various measures to meet the requirements of the modern poultry industry. Constantly evolving, modernized management forms the basis for this. Our first successful project was the develop-

ment of the LOHMANN apps, specially tailored to the needs of our customers, such as the LOHMANN Performance Specification App and the Lighting Program App. We reported on this project in a previous issue.

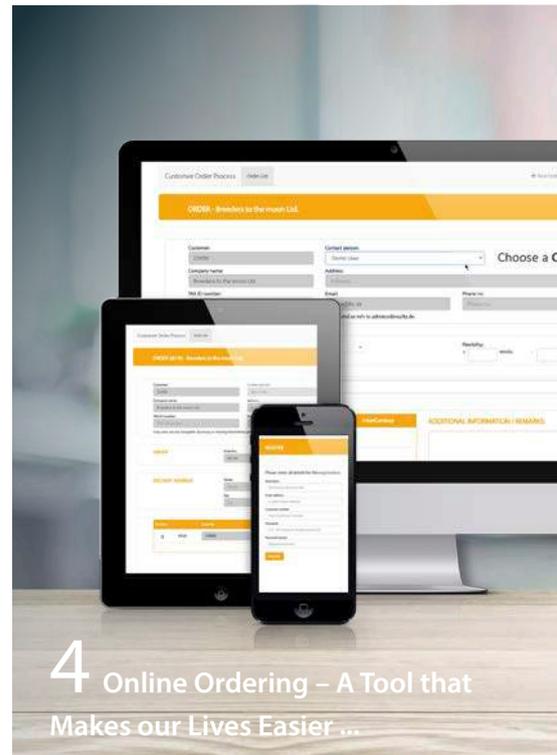
Another important step in this direction is our Online Ordering System and FSP Online (Flock Surveillance Program) launched at the beginning of this year. Both systems help us to facilitate the ordering process and make it more precise. Besides modernizing our technical tools, we are also focusing on expanding our technical service team and making it more specialized so that we can further improve our unique after-sales service. This new structure allows our experts, who specialize in different areas, to better meet our customers' differing requirements. You will find full details of these two important improvements in our cover story.

We hope you will enjoy reading this current issue of our LOHMANN POULTRY NEWS.

Sincerely,

Javier Ramírez Villaescusa
Managing Director

Javier Ramírez Villaescusa



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LOHMANN SCHOOL



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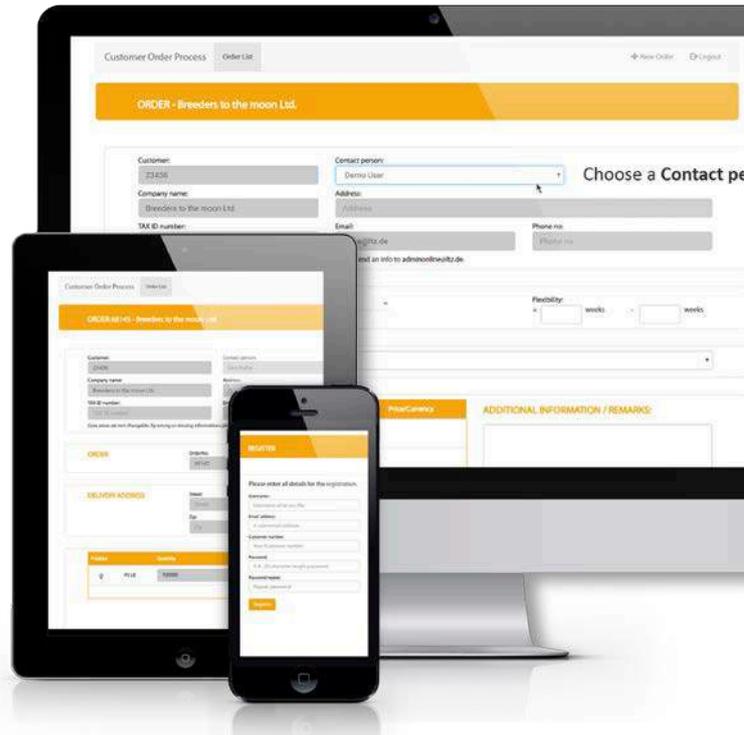
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LOHMANN ONLINE ORDERING

A tool that makes our lives easier



Times are changing. The technological era has arrived and doesn't stop at the gates of the poultry industry. As market leader in the poultry breeding sector, LOHMANN TIERZUCHT is willing to play a leading role in technological progress. We welcome new technologies that can make our lives easier in different areas. An important step in this direction is our Online Ordering System, which was launched at the beginning of this year.

Progress – development – success

LOHMANN TIERZUCHT is the first breeding company to introduce this kind of online ordering program.

One of the main reasons for developing a new, more efficient order system is the perishable nature of our products. A company such as LOHMANN, dealing with live chicks, needs to make the whole ordering system more dynamic. First and foremost, this development represents an unstoppable change from paper-based data storage and communication to digital formats. We need to adapt to this change in order to stay up to date. Sticking with a process that has always worked well does not necessarily guarantee success in the long term. We have to move forward and show initiative.

Time efficiency and responsibility

Under the old system, order forms were filled in by our sales staff in conjunction with the customer, signed and passed on to different departments such as planning, logistics and production. This procedure

was time-consuming and could delay the whole order management process. The new online platform is time-efficient: the sales representatives and all the other departments involved are now able to access the order information at the same time and the information flow is not delayed or interrupted. The benefit for the customer is that they do not have to hand over responsibility for their order. They can fill in the order form themselves and the information is immediately forwarded to the relevant departments. They can also update details as soon as any changes occur and all parties concerned are notified immediately. Every time the status of any order changes or a new order is placed, every user (customer and LOHMANN departments) receives a confirmation/notification email. A list of orders 'pending' is also shown on the platform. The customer can access the data at any time.

Accessibility wherever you are

The program not only focuses on time efficiency but on availability as well. The

main channel for accessing the online platform is the computer or laptop, but a smartphone or tablet can also be used, of course, and it is available and accessible by all users everywhere 24 hours a day. This makes the system more widely accessible in any situation. Orders can be placed from anywhere 24 hours a day and changes can be made immediately. This accessibility improvement will make the process more attractive from the customer's perspective. Other technical details are also designed to make the customer's life easier, such as the overview showing the most recent shipments and future estimated production in graph form. Only the required option has to be selected instead of entering the whole data every time.

This is the direction LOHMANN has taken with the online platform implementation. Customers can place their orders whenever it is convenient for them – at any time and in any situation.

Stable customer relationship still LOHMANN's main aim

Our main aim always has been and always will be to build and maintain strong and successful business relationships with our customers. Our online ordering system guarantees functional and effective communication between all the relevant parties. We can now use the information received directly from the customer to better plan production and maximize

customer satisfaction. The customer has everything under their own responsibility and control. Orders now have to be placed and amended in writing online. This avoids communication errors over the phone and makes the whole process more transparent for both parties. Avoiding unnecessary discussions and misunderstandings is always a big step towards building a balanced, satisfactory relationship between buyer and seller. The customer's order

preferences are now reflected on the platform, showing the regularity of orders, quantities, preferred time periods, etc. We can now use this information to better plan production and maximize customer satisfaction.

We firmly believe that this will be the first step towards a new, promising future, always keeping in mind our principle: Breeding for Success – Together.

Marketing Department



LOGIN

Username / Email address
 Password

Type in your Username or Email and Password

Login

Forgot your password? Not registered?

REGISTER

Please enter all details for the registration. An activation email will be send to your email address.

Choose a Username

Username:

Email address:

Customer number:

Password:

Repeat password:

Register

Customer Order Process Order List

ORDER 89745 - Breeders to the moon Ltd

Customer: Contact person:

Company name: Address:

TAX ID number: Email: Phone no:

Order date: Order date: Valid date:

DELIVER ADDRESS

Street:

Zip: City:

Product	Quantity	Price/Quantity	Additional Information / Remarks
PS LR	10000	11,01 EUR / piece	
	Sum	110.090,00 EUR	

Customer Order Process Order List

ORDER - Breeders to the moon Ltd

Customer: Contact person:

Company name: Address:

TAX ID number: Email: Phone no:

Choose a Contact person

DELIVERY

Preferred destination:

Product	Quantity	Price/Quantity	Additional Information / Remarks
PS LR		11,01 EUR / STK	
PS LR		10,98 EUR / STK	
PS LR CLASSIC		11,23 EUR / STK	
PS LR CLASSIC		11,23 EUR / STK	
Summ		0,00 EUR	



New responsibilities in the Genetics Department – LOHMANN's core under new direction

Effective October 2016, Dr. Matthias Schmutz took over the position of "Director of Research and Development and Chief Geneticist" at LOHMANN TIERZUCHT. Dr. Schmutz was promoted as the new person responsible for this position and will continue to run the successful breeding programs of LTZ and lead the genetics team.

Dr. Matthias Schmutz – 20 years' experience in the layer breeding business

Guarantee for Continued Success

For more than 20 years, Prof. Preisinger was covering this position. Now he changed from LOHMANN to the Holding level at the EW Group and assumed his new job as Chief Technical Officer (CTO) for layer breeding. Dr. Schmutz with his long time experience in the company will be the best choice to guarantee the seamless transition of the dedicated and passionate work for genetic improvement of the birds according to market needs. This is the foundation of the success stories of our company and with Dr. Schmutz the continuity of this success is ensured.

Career and Experience

Dr. Schmutz completed his University degree in animal breeding in 1991 and PhD study in 1995 at the University in Kiel, Germany, with the evaluation of data from the breeding of swine herds. After leaving the University environment, Dr. Schmutz worked with the optimization of the routine dairy breeding value evaluation for four years at the German Center for Holstein Breeding Evaluation. In 1999, at the time when Prof. Dietmar Flock retired and Prof. Preisinger became chief geneticist, Dr. Schmutz started working for LOHMANN TIERZUCHT. Since then, he has always been working in the genetics team and has been actively involved in decisions related to breeding strategies. Changes in the management of LTZ particularly in 2006, made it necessary for Prof. Preisinger to pay more attention to executive decisions. Already during this time, the main responsibility for the daily breeding work at LTZ was handed over to Dr. Schmutz. Together with the other members of the genetics team, the successful breeding programs of LTZ were conducted.

Our Mission:

Balanced breeding targets and successful birds

The focus will be put on the further improvement of the performance profile of our successful birds. Creating genetic progress on the pure line level and implementing this progress to the commercial level as soon as possible, have always been the strong parts of our breeding set-up and for sure, it will continue in this way. Our balanced breeding targets is the most important mission as our breeding company will continue to meet the growing worldwide demand for high performing layers to produce table eggs of top quality. Only in a situation where the commercial egg producers can achieve excellent performance and efficiency, can the breeding company have a sustainable future. We will continue to work very hard to maintain our leading position in this global market.

Investments of money and resources

In order to meet the future needs of the markets, LTZ has invested a lot of money and resources in the breeding programs in the past years. These investments include the following:

- New pure line farm in Canada
- New pure line farm in Spain
- Reconstruction of the German breeding farms to enriched single cages
- Relocation of the progeny field test from mainly Germany into Russia, Spain and Colombia, and the continuation of field testing in Japan
- Development and Application of the Genomic Selection technique

Investments will continue to ensure the sustainability of the balanced breeding program in the future, also under the new personnel constellation. The nearly 20 years' experience of Dr. Schmutz in the layer breeding business will guarantee that the successful way of selection will continue to be focused on economically important traits and ensure that the portfolio of the LTZ breeds remains well prepared to face future challenges.

Genetics Department

LOHMANN Technical Service Team



Outstanding after-sales service

The enormous genetic potential of LOHMANN birds has been proven over the years through the continuous advances in their performance worldwide. Current analysis of production data captured from LOHMANN pure lines along with field data of parentstock and commercial flocks received from our customers confirm this fact. Utilizing this genetic potential requires optimally adapted, up-to-date management tools and optimum health conditions in light of the nutritional requirements of these modern layers. This is where the LOHMANN Technical Service Team comes in.

Technical Service Team – a core part of LOHMANN

The Technical Service Team has been a core part of the LOHMANN business ever since our early years. Besides strengthening our sales success, this kind of after-sales support plays a central role in our customer relationships. Every Sales and Service team member in every area of the world is in close contact with their customers on the ground. They handle basic customer demands such as carrying out routine visits, answering questions and responding to elementary requests.

Team of experts

Besides our Sales and Service representatives dedicated to every area, our Technical Service Team is supported by a team of experts. The team is made up of different technical service groups covering the most important topics relating to layer breeder and commercial business. At present, these groups are as follows: Incubation and Hatchery, Flock Management, Feeding and Nutrition, Diagnostics and Diseases, and Quality Management.



Management tools

Besides customer support and care, the Technical Service Team is responsible for supplying our customers with a range of publications and management tools. LOHMANN experts have recently developed a series of more effective IT tools in line with modern customer support and communication methods. These new tools include smartphone and tablet apps such as the Specification App and the Lighting Program for different LOHMANN breeds. Another very useful tool is Flockman4U, designed for flock data recording, evaluation and anonymized benchmarking in a worldwide database.

New program

A new online Flock Surveillance Program (FSP) gives customers an overview of their current DOC deliveries. It enters relevant information such as transport details and 7-day mortality and uploads pictures relating to shipments and housing.

Schools and courses

Another essential role of the Technical Service department is organizing various seminars worldwide for sharing and exchanging business-related topics and ideas with our customers. The LOHMANN School and our Hatchery Course held in Cuxhaven every year are examples of these training

events. In other words, from the first day of a day-old chick's life through to production maturity, our Technical Service team does its very best to safeguard the performance and profitability of LOHMANN birds on the customer's premises.

Farhad Mozafar



LOHMANN HATCHERY COURSE 2016

Hatchery Practice in Cuxhaven

In early September (5th to 9th) we welcomed customers from all over the world to our LOHMANN HATCHERY COURSE 2016.



Spotlight on hatchery-relevant issues

The LOHMANN HATCHERY COURSE focuses on hatchery-relevant issues. It always covers a broad selection of topics, ranging from breeding for better hatchability and chick quality to hatchery management and pre-incubation to improve the hatchability of stored eggs. Very interesting for all participants was the practical part on egg break-out. At our seminars there is always an informal, friendly atmosphere which invites the participants to ask questions and have fruitful discussions with our LOHMANN experts.

Leisure time and excursions

In addition to discussing technical issues, we also made sure that fun and leisure were in plentiful supply. We organized a sightseeing tour of Bremerhaven, and the participants' singing voices were put to the test at our karaoke session on one of the evenings.

The LOHMANN HATCHERY COURSE was rounded off with an excursion to the Netherlands, with an opportunity to visit the Agromix hatchery in Lunteren.

It is always extremely important for us to be able to share our knowledge with our customers in order to ensure a successful business relationship. We hope we were able to do so this time too and that the participants enjoyed the event as much as we did.

Marketing





EUROTIER 2016 – VIV ASIA 2017

ULTRA-MODERN CORPORATE EXHIBITION
BOOTH AS VISITOR MAGNET



EUROTIER 2016 in Hanover



VIV ASIA 2017 in Bangkok

In November 2016 and March 2017 it was once again time for LOHMANN TIERZUCHT to take part in the two most important trade fairs for poultry and agriculture: EuroTier in Hanover and VIV Asia in Bangkok.

New exhibition booth

These two major global trade exhibitions on modern animal husbandry gave us the perfect platform for presenting our new, ultra-modern corporate exhibition booth, which, together with our well-known, internationally recognized brand, formed a magnet for customers and visitors alike, both in Germany and Thailand.

EUROTIER

Internationalism of EuroTier reflects internationalism of LOHMANN TIERZUCHT

The increasing internationalism of EuroTier, this year with a record-breaking 163,000 visitors from over 100 countries, is also a reflection of our customer visits worldwide. Overall, our participation at the fair was a resounding success.

Spanish flair in Hanover rounds off exhibition days

As a highlight during the fair, we offered our customers a special opportunity to get together and share experiences. In the late afternoons on two exhibition days we brought a touch of Spanish flair to our stand, offering visitors some original Spanish jamón ibérico (Iberico ham) prepared by a dedicated professional cortador de jamón (ham cutter) – rounded off with a good glass of Spanish red wine, of course! So on both evenings, the LOHMANN TIERZUCHT team was able to bring a long day to a relaxing close in the company of customers and visitors.

VIV ASIA

VIV ASIA 2017 was also a great success for LOHMANN TIERZUCHT. This major show had a truly international feel and attracted an impressive number of professionals. The number of international exhibitors and visitor numbers were more than satisfactory.

The importance of poultry in the VIV Asia profile has been underlined yet again. Poultry was the main attraction at this exhibition and a wide range of products for poultry production was on show. LOHMANN was delighted to meet both valued customers and potential business partners. In the vibrant setting of the world's leading trade exhibition presenting the entire feed and meat supply chain, we were happy to share our knowledge and ideas.

The right hen for every management – the right egg for every market. This is our maxim, which we were once again able to emphasize at both exhibitions. Above all, it is always important to us to strengthen our ongoing dialog with customers, in line with our philosophy:

Breeding for success... together. We would like to express our thanks to everyone who visited our stands and look forward to meeting you again in the near future.

Marketing



EUROTIER 2016 in Hanover



VIV ASIA 2017 in Bangkok



Another Successful LOHMA



LOHMANN TIERZUCHT held another successful school in Latin America. The venue was the beautiful Lake Atitlan in Guatemala, a well-known tourist attraction in this country where LOHMANN is growing consistently year after year.

Long-lasting business relationships

In order to honor and celebrate the 25 year partnership between LOHMANN TIERZUCHT and our long-standing customer Incubadora Regional, we chose Guatemala as the host country for our Latin America School. At the end of the event LOHMANN also honored all the participating distributors, with partnerships ranging from one year to an incredible 34 years.

Wide ranging audience and speakers

Hosted by LOHMANN and our distributor Incubadora Regional (the Ordoñez family), 112 participants (distributors and their direct customers) from 13 different Latin American countries attended the event. The presence of the LOHMANN TIERZUCHT team, including management, geneticists, a nutritionist, a veterinarian and sales and technical service people, was

one of the highlights of the event. Local Guatemalan authorities also participated and spoke to the high-level audience during the two seminar days.

General content

The content covered all aspects of egg production, such as breeding key factors needed to get the best out of our birds, animal welfare, nutrition, and so on. Other important topics were the global cage-free movement and international animal trade issues surrounding the ever challenging sanitary status across the world. Last but not least, one of our head geneticists gave a presentation on the genetic improvements that have taken place since the last Latin American School held in Paraguay in 2012 and the breeding strategies that will keep LOHMANN birds market leaders in the years to come.

LOHMANN improvements

We also gave a presentation on the internal improvements in hatchery infrastructure and logistics which we have introduced to overcome delivery challenges from and to any country. New tools such as the LOHMANN apps and new management guides designed to help egg producers get the maximum genetic potential out of our birds were also presented.

LOHMANN SCHOOL strengthens business relationships

LOHMANN School is always more than a technical event. It is still the perfect occasion to strengthen relationships and exchange experiences, as there are always different points of view on egg production under a broad range of systems.

NN SCHOOL Latin America



New venue: Colombia

At LOHMANN, our guiding principle is to keep our customers all over the world well informed and perfectly trained. Therefore, the new venue for the next LOHMANN SCHOOL LATIN AMERICA was announced. All participants have been invited to join us again in Cali, Colombia in 2018. LOHMANN TIERZUCHT and our Colombian customer Pronavicola are very much looking forward to hosting another edition of this successful event.

Thomas Abdo Calil





Outstanding Technical Service in Peru

Excellent after-sales service at LOHMANN TIERZUCHT

Keeping its philosophy of continuous after-sales service for customers, LOHMANN TIERZUCHT's sales and technical service team has reinforced its presence in Peru with frequent visits and information sharing. In 2016 they visited Peruvian customers a massive 11 times!

Our local Latin America personnel are constantly on hand to support local customers. But our service does not stop there: our technical service people from Germany are also always prepared to share knowledge and experience in the various technical service fields in order to solve problems and maintain our birds' high performance standards.

Broad presence in Peru

With our broad presence in Peru, LOHMANN birds are raised under all the different climatic conditions in this country, from the Amazon region to the desert. And not forgetting the different caging structures resulting from this diversity. In 2016, LOHMANN technicians made visits to 11 commercial flocks. Every shipment and placement of our birds is followed by a member of our sales and technical service team in order to ensure parentstock chicks are properly looked after in order to meet the demands of the permanently growing Peruvian market.

Full range of technical knowledge

LOHMANN after-sales service includes ongoing visits by our technical service staff in different sectors, such as geneticists, veterinarians and nutritionists. Robert Pottgueter, our nutrition expert, visited some customers and gave presentations with a special focus on prelay feed. As he states, "Prelay feed is an excellent nutritional tool to support layers during the transition period from the pullet phase to the start of egg production and should be used for roughly 10 days before the first eggs show up in the flock, which

means a maximum of 1 kg of feed per pullet – 800 g might even be the better solution." The visits usually comprise technical updates and management of parentstock flocks, followed by field visits to commercial flocks across the country, from the rainy climate regions in the north right down to the desert in South Peru.

We are extremely happy to see LOHMANN becoming stronger than ever in this significant market for us.

Thomas Abdo Calil

New Member of Sales & Technical Service Team Latin America

In order to continue delivering excellent support to our customers in South and Latin America, we are delighted to introduce our new colleague, Braulio Ruiz.

Mr Ruiz joined the LOHMANN TIERZUCHT sales and technical service department on 1 March. In this new role he will focus entirely on Latin America. Mr Ruiz assists our Sales and Technical Service Team Latin America.

We are very glad that we could welcome a professional with such a vast experience in poultry production as well as in quality management and food safety. For more than ten years, Mr. Ruiz worked as director of the quality and veterinary advisory department for a leading egg production company. During his career he has also been president of the Association of Veterinary Doctors, AMEVEA CHILE.

We are sure that Mr. Ruiz will support our Sales & Technical Service Team Latin America with full commitment.





1^{er} Séminaire LOHMANN MAROC Marrakech - du 09 au 11 décembre 2016

Great Expectations of a Successful Future Celebrating a New Partnership between SNV and LOHMANN TIERZUCHT

Africa currently has a population of 1.2 billion, with Morocco ranked 11th with a population of 35 million. The country has the 12th highest per capita GDP (gross domestic product) in Africa (\$4,800), which places it in 100th position worldwide. Three per cent of its annual per capita GDP is produced by the poultry sector, with annual production of 5 billion consumption eggs and 543,000 tons of poultry meat.

SNV and SES Warren

There are 49 hatcheries producing broiler chicks in Morocco, but only five companies keeping layer parentstock, all with exclusivities on the major breeds present worldwide today. The biggest company is SES Warren, which has a market share of 35 % in the layer sector. It is a subsidiary of SNV, which is also the oldest breeder company in Morocco, founded in 1969. Both companies produce 15,000 tons of feed per month and 300,000 broiler chicks and 90,000 layer chicks per week.

Introduction of LOHMANN BROWN

SES Warren has been producing H&N chicks since 2008. In 2016 the first LOHMANN BROWN parentstock chicks were finally housed on a new farm. This farm was purpose built for this additional business, allowing the company to offer both breeds to their customers. The LOHMANN line was introduced in Morocco

in 2005 by Grapoulima. After the latter's collapse in 2011 and following an absence of five years, LOHMANN TIERZUCHT is now back on the market.

Celebration of new partnership

In order to celebrate this new partnership, SNV and LOHMANN TIERZUCHT organized a three-day seminar in the 5-star Jardin de L'Agdal Hotel in Marrakesh from 9th to 11th December 2016. The presentations given by a range of poultry production experts covered various topics such as the genetic development of the LOHMANN lines, management of LOHMANN birds and the present AI situation worldwide. President of Diana Holding and owner of SNV and SES Warren Ghita Zniber, SNV CEO Anouar Tahiri and LOHMANN TIERZUCHT managing director Javier Ramírez were also present. The two directors welcomed the guests by giving a presentation on their respective companies.

Viola Holik

Excellent combination of Moroccan hospitality and technical issues

Over 200 people attended the meeting and enjoyed the warm hospitality of the Moroccan people, including the families of the invitees as well as visitors from right across French-speaking Africa, such as Algeria, Tunisia, Cameroon, Gabon and Ivory Coast. Discussion forums were held in which the audience were able to obtain answers to questions on layer management, and participants also had a chance to speak to the experts in person in the breaks and

during the meals. An extensive entertainment program was put on, including dinner with entertainment in the beautiful Palais Soleiman, and city tours were enjoyed by all participants and their families. The seminar ended with a joint breakfast on the morning of 11 December before the guests departed.

The seminar marks the beginning of a successful partnership and LOHMANN TIERZUCHT is looking forward to serving and supporting Moroccan egg producers once again.





The next meeting of the 'Guild of Gold' – This time it is not just

The meeting was held on the Eurotier Exhibition in Hanover in November 2016. The 26th session of the International Club was opened by the President of the Club, general Director of Pishminskaya Poultry Farm, Sergey Vladimirovich Timofeev.

Sales Growth despite of Avian Influenza

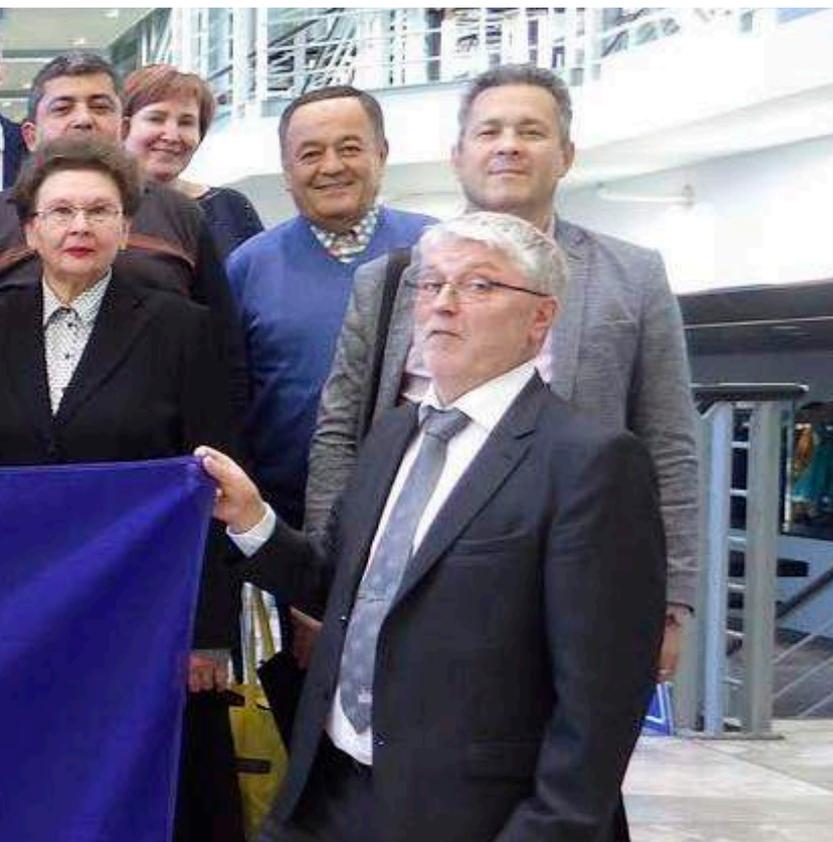
The managing director of LOHMANN TIERZUCHT Javier Ramírez was first to talk. How to maintain uninterrupted supply during outbreaks of avian influenza? How does the company deal with this and how can it maintain its sales growth? All this is because LOHMANN has spread its flocks/hatcheries round the world (Spain, Great Britain, Denmark, Canada, Brazil, soon Russia). The example of one of the Toronto - Siberia Russian deliveries, clearly showed what a huge work the logistics department had accomplished in this case by monitoring the condition of the chickens, as well as the microclimate in the vehicles along the entire route. It was a long trip, with two intermediate stops (Amsterdam, Ekaterinburg).

New Hatchery in Tula

In his speech, Norbert Mischke, regional area manager CIS, elucidated the situation in the Russian commercial egg market and the position of the LOHMANN TIERZUCHT's partners in the ranking of the leading companies in the field. But the main theme of his report was the new LTZ hatchery in Tula, what stage construction had reached, how the cost of transporting chicks is calculated according to volume and distance, how the price per chick is formulated (membership in the LOHMANN Club, yearly volume, vaccinations, etc.)

Genetics

The reports of LOHMANN's chief geneticist Dr. Matthias Schmutz "What influence does the discussion about animal protection in Europe have on Genetics?" and of the geneticist Dr David Cavero



“LOHMANN-Russia” Klub just on German soil

“Genomic Selection” were of interest for all the participants. The slides showed the latest developments in the breeding programme and the assessment of breeding properties on the genomic level. In addition to the “traditional” stock characteristics, geneticists now have to work on the characteristics that are important for free range content (stability of feathers, beak shape assessment, etc.) Great importance is attached to the stability of various indicators at the final cut off of the productive period.

LOHMANN Klub New Members

After the concluding discussion on the reports, new members were admitted to the International LOHMANN Russia Klub in the name of Professor Winfried Bonitz: Bolzhanin, Bashkirkaya Poultry Farm, Gadzhigabylskaya Poultry Farm (Azerbaijan) and Koger (Kazakhstan)

Viva España - a busy and cultural program in Spain

A short flight to Madrid and “Spain welcomes you!” The mild November temperature, lively faces, here there is everything to suit all tastes and characters! Spanish colleagues (LOHMANN Breeders

Spain - a subsidiary of LOHMANN TIERZUCHT and IBERTEC - LOHMANN TIERZUCHT’s sister company) organized a rich and very interesting programme. In order to get acquainted with the poultry industry of Spain, various companies were visited and the participants had an opportunity to get a practical knowledge of the poultry keeping systems, visit the IBERTEC hatchery, LOHMANN Breeders Spain Poultry Farm, the egg sorting and packaging department of Kamar. In addition, a seminar was held in Labdial laboratory with reports on LOHMANN’s position in the country’s market, as well as in which countries the export of day old chicks from Spain was conducted, the ongoing sanitary control programs at the hatcheries of the breeding and laying farms were reviewed. Invited speakers from the Egg Institute talked about the situation on the egg market in Spain and Europe.

The cultural programme was not neglected either. Trips were not limited to Madrid, there were also trips to Toledo and Segovia. Participants enjoyed Spanish food and came away with a lot of unforgettable impressions!

Galina Scholz

REGIONAL SEMINARS ON MANAGEMENT AND MAINTENANCE OF LOHMANN BREEDS IN CIS COUNTRIES

The success of LOHMANN's activities in these regions depends not only on increasing sales of LOHMANN parent stocks, but also in many respects on providing customers with technological support for their birds. The need for continuous improvement of the skills of local poultry farm specialists who are already working with LOHMANN breeds, and the need to attract new customers and support LTZ's clients in widening their customer base require an understanding of the importance of holding joint seminars and training on site. These events give producers the chance to receive up to date know how as well as a basic academic understanding that is still very relevant.

Seminars and Training on Site

So in 2016 LOHMANN TIERZUCHT together with their clients successfully held several regional seminars. The producers themselves decided the topics. In practice it is seen that the most common questions and problems concern a comprehensive programme for keeping, feeding, lighting and biosafety. Russia and Kazakhstan have the same poultry rearing school of thought so the seminar topics were largely the same.



Okskaja Poultry Farm Aleksandovsky branch and LOHMANN TIERZUCHT

„The main aspects of the technology of growing and veterinary support of Lohmann Breeds“ Ryazan, Russia

28–30 June 2016

Okskaja and Aleksandrovsky

Okskaja Poultry Farm (www.okskaya-ptf.ru) has more than 200,000 parent stocks and 3 million commercial laying hens. In 2016 the company produced 730 million commercial eggs. Together with its PPR Aleksandrovsky branch, the company is today not only one of the largest producers of commercial eggs, but also the largest second-order breeder Russia. Built a few years ago, the hatchery at Pas Reform, with a capacity of 12-14 million business chickens a year, has given the company a leading position in Russia. Some of the chickens produced are used for own production, approx 70 % of chicks are sold to other businesses in Russia. The task of the organized seminar was to train its client base.

Seminar

A joint seminar with the JSC Okskaja Poultry Farm in June 2016, gathered 70 people. Representatives from 31 businesses attended. Improved genetics is not just a question of high productivity or low feed use. This is very much the company's best financial result, achieved by an extended production period and low feed conversion.

A healthy bird is necessary for high productivity

Everyone knows that in Formula 1 racing the highest speed and power come from the fuel: quantity and quality. "The same applies to a highly productive bird" Norbert Mischke underlined this on more than one occasion in his reports. The best bird reaches 100 % productivity at peak production, one egg every day. This does not just go on for one week. Nearly 20 % of the livestock from 30 to 42 weeks (84 days) reaches 100 % productivity and for 2 % this productivity lasts for 207 days. The feeders have to be constantly full for these champions. And not just full, but full with top quality balanced feed. Nearly all the reports on the management of the cultivation and maintenance of high-yielding layers have noted this.

A healthy bird is necessary for high productivity, this was the theme of all the reports on Bortyuk's biosafety and optimal vaccination programmes.



Snezhinskaya Poultry Farm Ltd, LOHMANN TIERZUCHT and DSM Nutritional Products Seminar “Genetics, Technology and Veterinary Medicine: the components of successful egg production” Pritomye, Russia 01.–03 June 2016

Snezhinskaya Poultry Farm

The Snezhinskaya Poultry Farm Ltd is a pedigree breeder of the Inskaya Poultry Farm with an annual commercial egg production of more than 500 million. 40 % of its breeding production is for its own needs: to provide breeding material for the Inskaya and Yashkinskaya Poultry Farms. The remaining 60 % of chicks are intended to supply other businesses, both in Russia and abroad.

Meeting

Over 30 specialists representing 14 companies from Russia and Kazakhstan who are clients of the Snezhinskaya Poultry Farm met at an excellent venue on the bank of the Tom river. All the participants were interested in the theme of the seminar. Each had their own questions. Meetings and discussions were held after the main programme. According to customers' feedback, it was clear that everyone had got some answers or recommendations for the future.

Immune prophylaxis and optimal vaccination

Immune prophylaxis, setting up a correct and optimal vaccination programme is one of the important links in the chain of success. And as Dr Bortyuk (LTZ) underlined, a lot does not mean good. Less is more, the less antibiotics the better the digestion and use of all the ingredients of the diet, fewer vaccinations means the greater the strength of the body's immunity in response to the introduction of the necessary vaccines.

Breeding aspects

How to get a full-fledged and strong layer able to lay up to the age of 85-90 or 100 weeks of life. This issue is so vast and deep that it needs several seminars to elucidate it. Norbert Mischke (LTZ) touched on some important aspects of breeding. Correct and balanced diets together with proper lighting programme is one important factor. But it is only possible to bring this to each bird with the correct structure of the feed, with the so-called structured feed. This issue then becomes crucially significant with a high floor space per bird. At this point the problem arises of differential feed consumption because each animal cannot reach the feed at the same time.

Bone strength and high shell quality

DSM's specialists gave detailed consideration to the issue of the bird's mineral supply with a long production cycle for maintaining bone strength and obtaining high shell quality.

The high point of the seminar was the practical instruction by the specialists on correct beak trimming. For this Pieter Verschuuren, the author and producer of the only instruments for the side “V” shape beak trimming of young chicks (from 1st to 14th day of life) was invited from Holland. Firstly Pieter Verschuuren gave some theoretical training to all the specialists, and then all the participants could control and improve their knowledge and skills under the control of the beak trimming master.



The Koger Ltd and LOHMANN TIERZUCHT Seminar „Genetic, Feeding and Veterinary Issues in the LOHMANN Breed“ Almati 16–18 May 2016

Koger Ltd is the only partner of LOHMANN TIERZUCHT in Kazakhstan and occupies a leading place in the production of hatching and commercial eggs. In 2016 the company produced 295 million commercial eggs and over 5 million hatching eggs.

To expand the sales market for its breeding production, Koger Ltd, organized a seminar held in Almati in May 2016, with LTZ's assistance. The seminar was attended by representatives of 11 companies from Kazakhstan, as well as from Tajikistan and Kyrgyzstan.

Seminar topics

The Director General of Koger Ltd, K Shin made a presentation of the company and a brief overview of the state of modern poultry farming in Kazakhstan.

The main topics of the seminar were explained by Norbert Mischke (regional director of LOHMANN TIERZUCHT for the CIS and Baltic countries) and Yaroslav Bortyuk (LTZ Sales and Technical Service). In particular Norbert Mischke gave presentations on: the genetic limit of LOHMANN breeds; the particulars of feeding birds during their long-term maintenance in order to preserve shell quality; recommendations for feeding birds of different ages kept in one group; causes of and methods to prevent cannibalism. Bortyuk explained the issues of immunoprophylaxis in birds and biosafety in the business. As well as

the key note speakers, representatives of various companies cooperating with Koger Ltd, such as Miavit (Germany), Novus (USA) and others spoke at the seminar.

Norbert Mischke



Selection for shorter beaks to reduce feather pecking in laying hens

In recent years, the social behavior and welfare of laying hens has gained more importance in laying hen breeding programs. Damaging behavior such as feather pecking is of particular concern. Addressing this welfare issue has attracted more attention than ever before and is likely to become even more challenging with the prospect of a ban on beak treatment in many countries in the future.

Three different levels of pecking behavior

Feather pecking is affected by many different factors, so a multifactorial approach attending to different parameters should be taken to minimize its negative impact. This undesirable behavior can occur in every housing system; however, it is especially relevant and more variable in alternative cage-free housing systems due to the bigger group sizes and more complex environment. The literature describes three different levels of pecking behavior: gentle feather pecking, which does not result in the removal of a feather; severe feather pecking, which leads to feather losses at the back, rump or tail of the victim; and aggressive pecking, which is the most serious type of feather pecking and is usually directed at the head. One of the strategies for minimizing the problem is to select against this bad behavior. Directly observing and evaluating an individual bird in a group automatically is a technical challenge and is extremely time-consuming to perform manually.

Ban on beak treatment

Although beak treatment has proven to be a very effective preventive measure for avoiding feather pecking, there is a growing ethical controversy in which this practice is regarded as amputation. Some countries have banned this practice completely and others are set to join this initiative soon. The ban on beak treatment is a new driving force behind the search for solutions to reduce the incidence of feather pecking. Whether and to what extent genetic selection can contribute to this goal will be illustrated by the results of hen-specific measurements on the shape length of pure line layers.

Measurement of beak length

Several years ago, a special device was developed to generate precise data relating to the length of the hen's beak, in order to evaluate the feasibility of using it as an additional selection criterion. The idea behind it is as follows: if no beak treatment is carried out in the future, birds with blunt beaks will reduce the damage inflicted on their fellows if they start pecking. With the aid of this equipment, the

difference in length between the upper and lower beak (referred to as "beak length" below for simplicity) is measured and automatically saved to a database (figure 1).

Figure 1: Automatic measurement of beak length



As can be seen in **table 1**, there is no very clear trend in average beak length at different ages for different brown egg lines. However, it seems that the growth of beak tissue compensates for or even exceeds the abrasion in single hen cages. The phenotypic correlations between measurements at 23 and 48 weeks of age indicate an acceptable repeatability of the measurement at different ages.

A comparison between the different lines of the LOHMANN BROWN and LOHMANN LSL breeding program is shown in

table 2. The average values for beak length are based on around 3,000 individual hens in each line. The measurements were captured at 30 weeks of age.

As can be seen in **table 3**, the heritability estimates for beak length are at a moderate level, with h^2 ranging from 0.09 to 0.26 for the four lines of the LOHMANN BROWN and LSL breeding program. In light of the genetic parameters and the high variability found in the trait, breeding to reduce beak length through genetic selection is feasible. These heritabilities are at the same level as other selected traits such as plumage condition or egg number at the end of production (persistence).

As mentioned above, for the past 20-plus years LOHMANN layers have not only been scored for beak length but also for their plumage condition. Therefore, full-sibs and crossbred half-sibs with pedigree information are housed in group cages, both on breeding farms as well as on commercial farms under field conditions. In the field test, these layers are scored for their plumage condition at around 40 and 75 weeks of age. Families that show intact plumage are scored with the value 9, whereas families with damaged feathering are downgraded due to the amount of feather loss. Based on this information, genetic correlations between beak length and plumage condition and mortality were estimated. As can be seen in **table 4**, there is a positive correlation between mortality and beak length and a negative correlation between beak length and plumage condition. Birds with shorter beaks have lower mortality and better plumage condition

We conclude from our data that individual selection for blunt beaks, with a reduced difference in length between the upper and lower beak, will help to accelerate the reduction of feather pecking and cannibalism, while family selection for intact feather cover and liveability is continuing and management practices will be optimized.

Dr. Matthias Schmutz

Table 1. Average values \pm standard deviation for beak length (mm) at 23 and 48 weeks of age and their phenotypic correlation for the four lines of LOHMANN BROWN.

Line	23 weeks	48 weeks	Correlation
A	3.47 \pm 0.7	3.45 \pm 0.6	+ 0.41
B	3.36 \pm 0.6	3.52 \pm 0.6	+ 0.42
C	3.49 \pm 0.7	3.67 \pm 0.8	+ 0.30
D	3.07 \pm 0.6	3.00 \pm 0.6	+ 0.30

Table 2: Average values and variation coefficient for the beak length of different lines of LOHMANN BROWN and LOHMANN LSL origin

Line	LOHMANN BROWN		LOHMANN LSL	
	Mean (mm)	CV (%)	Mean (mm)	CV (%)
A	3.4	19	2.7	25
B	3.2	20	2.5	23
C	3.3	23	2.6	26
D	2.9	24	2.5	26

Table 3: Heritability of beak length

	A	B	C	D
LOHMANN BROWN	0,21	0,25	0,13	0,16
LOHMANN LSL	0,21	0,26	0,09	0,12

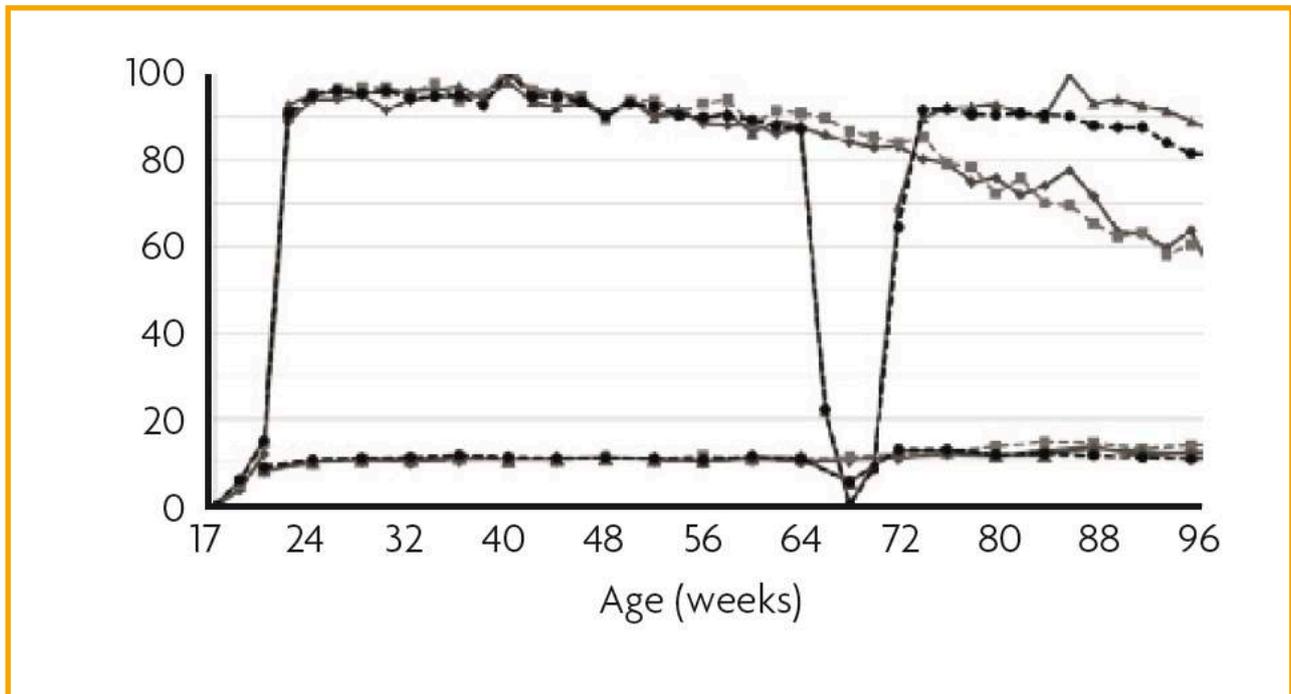
Table 4: Genetic correlations between beak length and plumage condition and mortality

Line	LOHMANN LSL	LOHMANN BROWN
Mortality	+ 0.19	+ 0.11
Plumage Condition	- 0.20	- 0.05



GENETIC AND ENVIRONMENTAL EFFECTS ON EGGSHELL STABILITY

Fig. 1. Extended production cycle with/without forced moulting (North Carolina Test Station – USA).



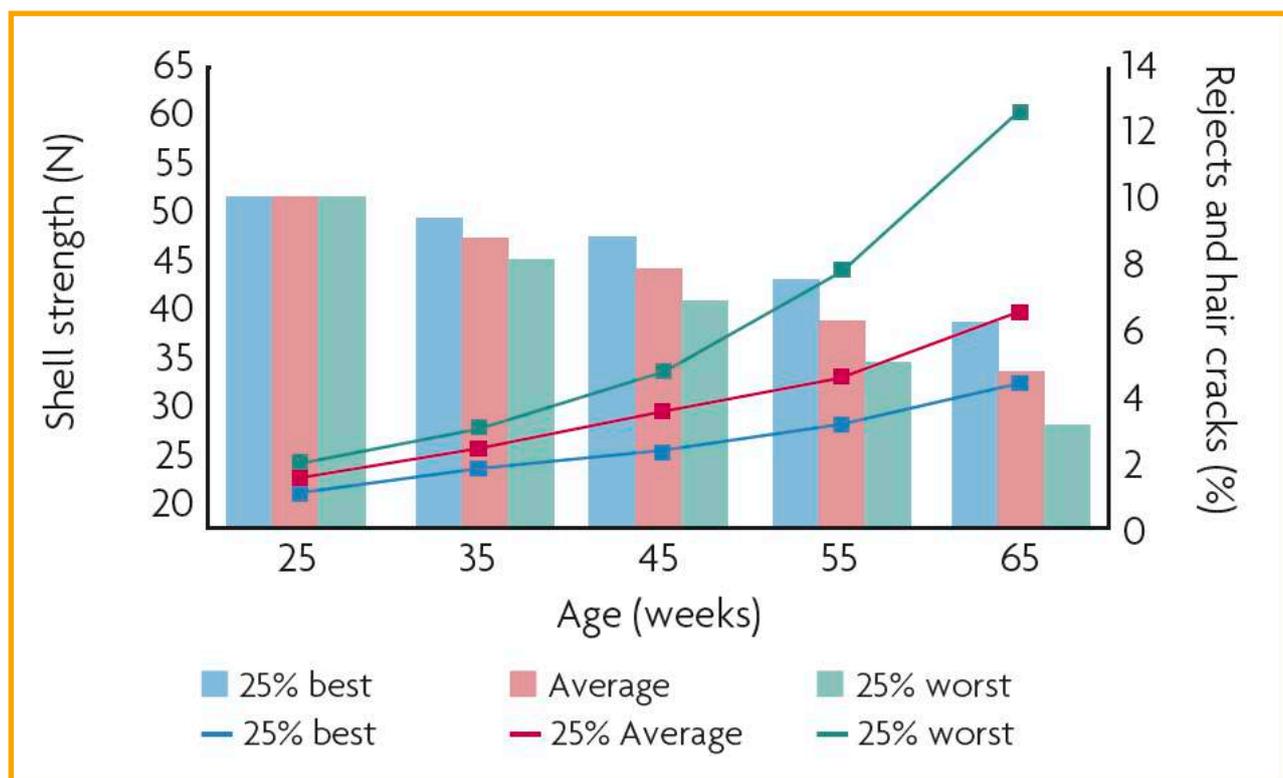
Modern commercial layers and breeders have the potential to produce a large numbers of eggs. Commercial layers producing noticeably above 330 eggs in a single laying cycle of 12 months is no exception under various field conditions. Meat type breeders have also become more prolific during the last decades, easily producing up to 180 hatching eggs in 40 weeks of production. Most performance tables for commercial layers give standards above 80 weeks of age, but today many commercial layer flocks are kept up to 100 weeks or more. In the near future laying flocks will be kept for longer production cycles, which requires more attention of all parties involved to maintain an accep-

table eggshell quality towards the end of lay. The greatest challenge that most table egg producers and breeder farmers are facing is to maintain optimal eggshell stability. At the end of production eggshell quality often deteriorates considerably, leading to substantial economic losses for farmers and hatcheries. Under field conditions some commercial layer farms manage to keep the rejected eggs below 5%, whereas others have more than 10% broken and (hair-) cracked eggs (Fig. 2). This wide variation indicates that several factors are involved in maintenance of good eggshell quality.

Factors affecting eggshell stability

A wide range of different influences affect the shell formation in the hen and consequently the possibility that the egg suffers any damage after it has been laid. The choice of the right strain (genetics) is a decisive factor. Numerous tests by stations worldwide and comparisons by major egg grading and packing companies show significant differences in rejected eggs between different layer breeds. It is well known that with increasing age of a hen shell quality usually deteriorates, however, not all layer strains show the same decline in shell strength. Management procedures applied by the farmer, like lighting and feeding programs, paying attention to egg collection

Fig. 2. Variation of shell breaking strength and percentage of cracks between individual farms in the Netherlands



and handling with care afterwards have a major impact on actual egg harvest per farm. Prevention of heat stress under hot weather conditions is crucial to safeguard production and egg quality. Correct climate control supported by feed supplementation will greatly contribute to improved shell quality. The health status of a flock needs to be safeguarded by a well designed vaccination program and comprehensive biosecurity. Many common diseases like infectious bronchitis, Newcastle disease and mycoplasma infection may cause substantial production losses and severely affect shell stability. The right equipment is also important to prevent eggs from breaking after being laid. Cage

(floor) properties, egg conveyor belt alignments, nests with good bedding and a state-of-the-art grading and packing machine are important technological issues. Finally, a well balanced feeding program with all nutrients reflecting the birds requirements during different phases of life is essential to allow the bird to lay 'well packed' eggs according to their potential. In this article only two major factors affecting shell strength will be addressed. First of all the contribution of genetics to improve shell quality and secondly how the nutritionist can support the production of stronger shells.

Genetics

Leading layer-type breeding companies have been selecting for decades for improved productivity and efficiency. Of course egg quality traits have not been neglected. Nowadays, a large number of traits are collected on pure line level in the pedigree farms. All those traits need to be included in a so-called index in order to be able to make a balanced selection of the candidates for the next generation. Several methods for measurement of eggshell stability are applied, however, only two have proven to be most effective. The use of devices measuring static breaking strength and crack detector for dynamic stiffness have greatly contributed to improved shell stability. Both traits have favourable correlations with most other performance traits and have a moderate heritability which allow the genetic improvement of shell stability.

Table 1. Recommended particle size distribution of limestone for laying hens (LOHMANN TIERZUCHT Management Guide).

Feed Type	Fine limestone 0–0.5mm	Coarse limestone* 1.5–3.5mm
Layer phase 1	30%	70%
Layer phase 2	25%	75%
Layer phase 3	15%	75%

*can be partly replaced by oyster shells

Nutrition

Comparison of eggshell quality properties in the Netherlands revealed a wide variation between different feed manufacturers. Despite the fact that all breeding companies publish feed recommendations for their strains, each feed company usually designs their own in-house feed recipes. In order to compose a feed which allows the birds to produce strong shelled eggs, several issues need to be considered.

Hot weather conditions

In hot climates where heat stress has a major impact on productivity and shell stability, additional actions are required to support the laying hens. Due to the combination of reduced intake of nutrients and respiratory alkalosis due to panting, shell formation is at risk. Addition of 2-3 kg sodium bicarbonate per ton of feed has proven to balance the alkalosis and contribute to stronger shells. Micro-ingredients like zinc, copper, chromium and manganese which play an essential role at the shell formation should be increased under heat stress. Finally supplementation of vitamin C and E helps the birds to cope with high temperatures.

Calcium supply

Most companies use limestone or (oyster-) shells as the main source for calcium car-

bonate. Besides issues like ratio of calcium release (solubility), first and foremost is the correct particle size distribution of the calcium source. In particular, the fraction of coarse particles should be sufficient. A feed with too high percentage of fine and medium sized particles will cause more broken eggs compared to feed with coarse particles.

Phase feeding program

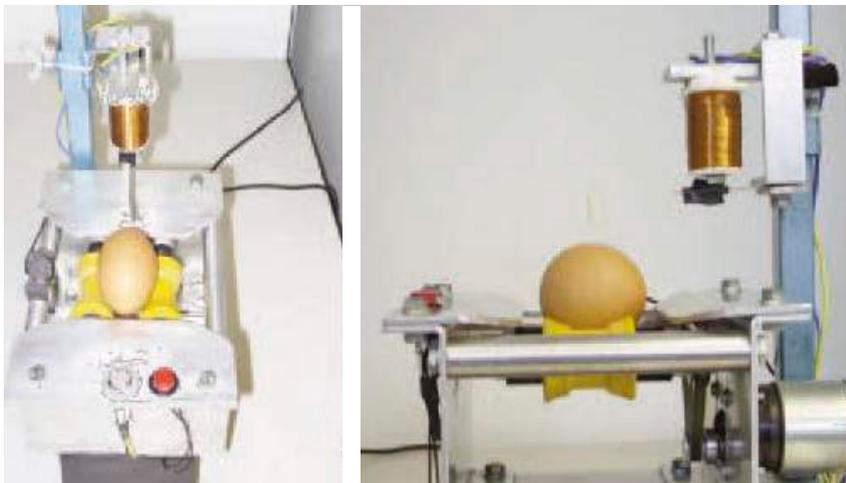
Throughout the production period egg weight normally increases and production gradually decreases after peak performance has been reached around 25 weeks of age. In order to fulfil the nutrient requirement in the different stages of life a tailor-made phase feeding program has been designed. The basis of such a program is an increase in calcium content with time, as both utilisation/absorption decreases with age and egg size increases. The available phosphorus level gradually decreases towards the end of lay. Protein (digestible amino acids) levels also decrease as birds tend to eat more when they grow older. Methionine levels which have a direct impact on egg weight also decrease in line with protein in order to prevent oversized eggs which are more likely to crack. A phase feeding program needs to be applied early enough during the laying period in order to prevent oversized eggs.

Layer birds adjust daily feed intake mainly in relation to their energy demand, furthermore increase in daily feed intake needs to be prevented. Overconsumption may lead to oversized eggs. Usually a constant level of energy of the feed throughout the phase feeding program is used under field conditions. The active form of vitamin D3 (1,25-Hydroxycholecalciferol) is essential for correct eggshell formation in the oviduct. Vitamin D3 is converted in two steps in the liver and kidneys to its active form. Birds that suffer from so-called fatty liver syndrome or have kidney damage benefit from supplementation of the active form of vitamin D3 in the feed. Taking care of liver health will therefore contribute to a good eggshell quality even in aging flocks.

Summary

Layers and breeders have a genetic potential for a high egg output. In order to produce mainly saleable and settable (hatching) eggs, eggshell stability is a crucial trait. Both genetics and balanced nutrition play an important role to maintain good eggshell quality. Geneticists have succeeded to combine a prolonged production period with good eggshell stability until the end of lay. Specially designed devices for measurement of shell are used to accurately distinguish hens laying strong shelled and weaker eggs. For the nutritionist hot climate conditions are an additional challenge. In order to maintain production of premium class eggs, rations need to be supplemented with extra micro-ingredients, vitamins C and E and sodium bicarbonate. A so-called phase feeding program with different rations during the production period is essential to safeguard performance. The main targets are to maintain a good eggshell quality, control egg size and balance nutrient supply to actual requirement. Coarse limestone particles are essential for a continuous calcium supply during the shell formation. Vitamin D3, converted by the liver and kidneys is required for eggshell formation in the shell gland.

Ron Eek



Device for the measurement of dynamic stiffness.

Fig. 3. Selection Index for layer-type birds with individual traits

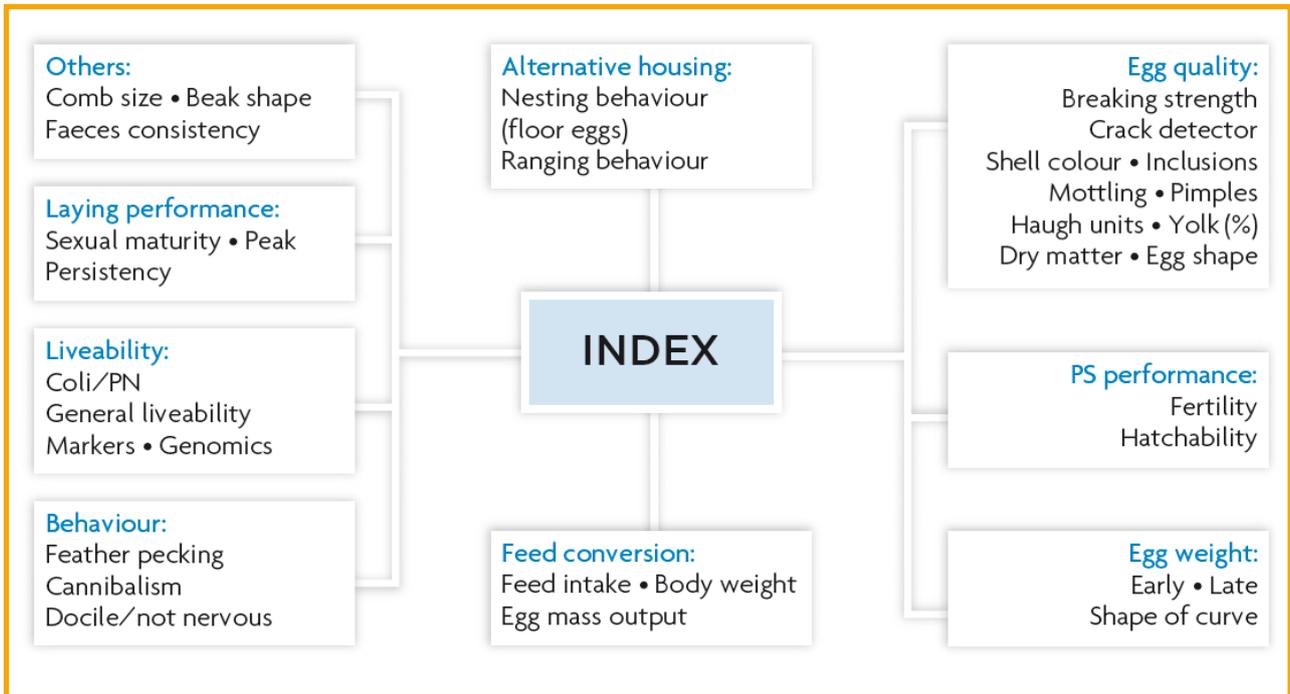
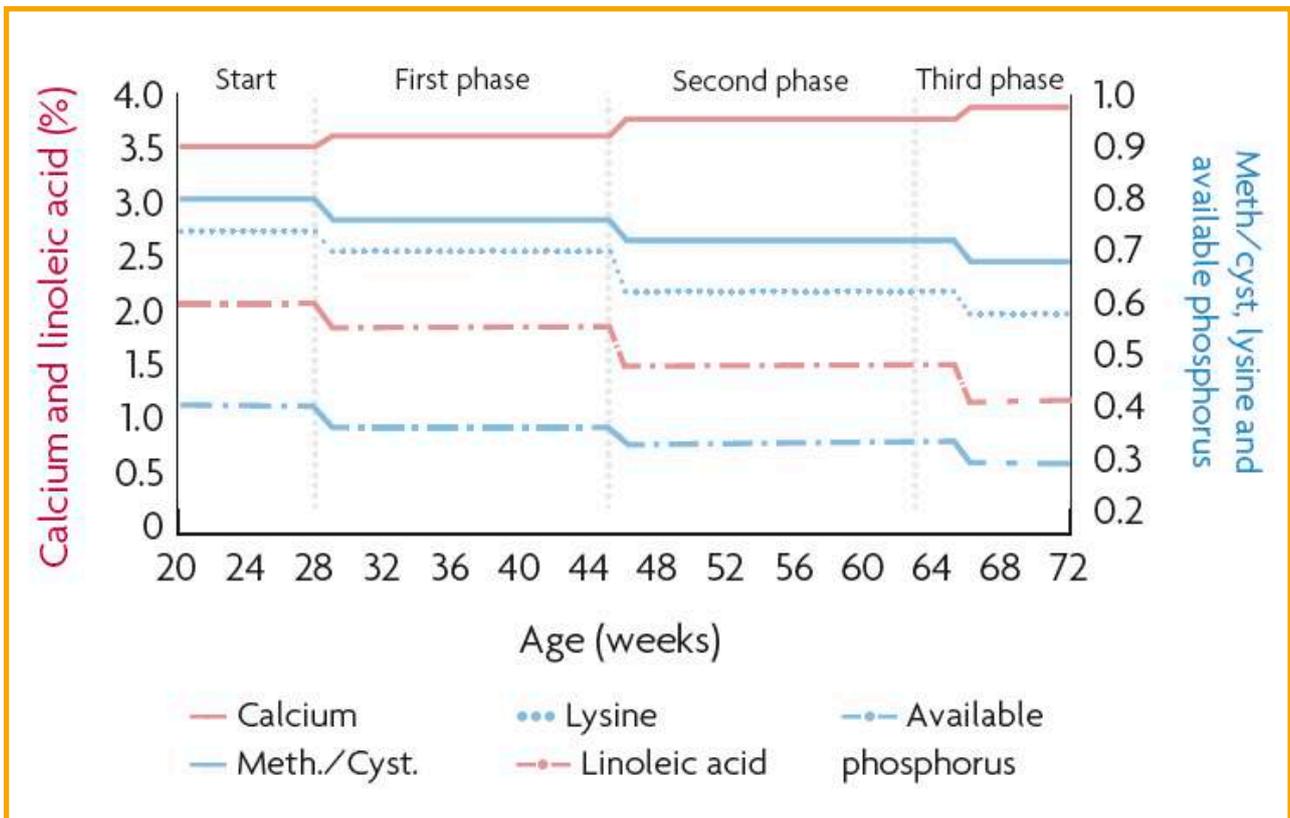


Fig. 4. Example of a four phase feeding program for layers



Crude Fat in Layer Nutrition

Basic knowledge of fat

Fat has nearly 2.5 times more calories than carbohydrates. Fat provides roughly nine calories of energy per gram, while carbohydrates (from corn and other cereals) provide roughly only four. At room temperature, saturated fats are solid in form while unsaturated fats are liquid. Examples of saturated fats used in poultry diets include tallow, lard, poultry fat, palm oil and so-called "greases". Examples of substances with high levels of unsaturated fats are corn oil, soy bean oil, sunflower oil and rapeseed/canola oil. Fats are composed of smaller compounds called fatty acids. Fatty acids are responsible for cell membrane integrity and hormone synthesis. Although there are many different fatty acids, poultry has a specific requirement for one – linoleic acid (C 18:2) – so it must be included in the diet. Linoleic acid is considered an essential fatty acid because poultry cannot generate it from other nutrients.

Why fat in the diet?

Fat must be present in the poultry diet in order to absorb the fat-soluble vitamins A, D, E and K. In addition to its role in nutrition, fat is added to feed to reduce grain dust and to bind the fine particles in the feed (premix, amino acids and minerals) to the coarser particles.

Fat also improves the palatability of feed, especially in mash feed. If there is a shortage of fat (fatty acids), the liver, which is the most important organ in the highly prolific layers of today, will have to provide fat and fatty acids for the body metabolism. This is a big challenge for the health of the liver, as the liver needs to provide fatty acids by lipogenesis – basically from carbohydrates. The digestion of protein and carbohydrates as basic sources of energy causes a high level of metabolic heat (heat increment) in comparison to crude fat, which will ultimately reduce daily intake under heat stress circumstances. Therefore, replacing energy provided from carbohydrates with crude fat is a beneficial way of supporting the metabolism of layers in a heat stress situation.

Level of crude fat in diets

A crude fat level of at least 5% in layer diets is highly recommended. To achieve this 5%, 2-3% of fat or oil has to be added, even to a corn/soy diet. Higher levels of crude fat and added fat/oil are even more beneficial. The maximum amount is defined more by technical reasons than by nutritional ones, as diets of up to 7.5% of crude fat are excellent for layers. This has been proven in different circumstances and climates all around the world.

Robert Pottgueter



Adding fat and oil to layer feed has at least five additional effects with increasing levels of crude fat and added fat/oil:

First	increases the metabolizable energy (ME) content of the diet and increases performance => egg numbers, laying percentage
Second	increases egg weight due to fatty acid profile (C 18:2)
Third	improves liver health, reduces fatty liver syndrome (FHLS)
Fourth	increases palatability of (dusty) mash feed
Fifth	reduces heat increment in heat stress situation

Imprint

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GOTOMEDIA WERBE- UND MEDIENAGENTUR



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