

# POULTRY NEWS

2/2017

## INTERNAL

LOHMANN Planning &  
Logistic Team

## CUSTOMERS&EVENTS

10<sup>th</sup> Anniversary of  
LOHMANN SCHOOL RUSSIA 2017

## TECHNICAL

Cute Egg: Providing a safe  
supply of eggs to hatch  
the next generation of chickens



# A MODERN ERA OF INNOVATIVE MANAGEMENT TOOLS HAS BEGUN!



**LOHMANN**  
TIERZUCHT

## Globally connected with LOHMANN



*This was the motto of our 55th Franchise Distributor Meeting, which was held in Madrid this year. Many different, related aspects were examined at the meeting. Globally connected with LOHMANN is, however, much more; it is this year's motto and, above all, that of the future.*

*Whereas in the past being truly globally connected was still difficult, the scope of today's technological advances, and identical technical standards all over the world, mean we now have various innovations that simplify the process of doing global business*

*with live animals, i. e. day-old chicks. All we have to do is recognise these opportunities as such and be ready to use them.*

*The development of various apps and programs and our Online Ordering System, which we presented in the last edition of Poultry News, demonstrate our readiness to seize the opportunities. The implementation of these innovations facilitates prompt communication and interactive cooperation between our company and our customers and can be used in various ways. You can read about the latest innovations of our technical tools in our cover story.*

*We want to take another step towards modernisation with our new E-Guide, which will be presented to you in this issue. Current data and recommendations or guidelines for the correct handling of our breeds is shown, supported and illustrated by films, links, etc. Our E-Guide is a source of information, accessible by our customers 24/7 and from no matter where.*

*On the other hand, personal contact and exchanging experiences and ideas still have top priority as they also contribute significantly to a global connection with our customers and business partners. The various training sessions and courses organised by us, not just in Germany but all over the world, as well as our participation at international trade fairs and events, are proof of this. Moreover, our experts from technical services, genetics and the veterinary laboratory are welcome guests at events organised by customers and they are always pleased to hold speeches and give advice and assistance.*

*Read about all this in the current issue of Poultry News. We hope that you will enjoy reading this edition and that it offers an interesting subject for everyone.*

Kind regards,

Javier Ramírez Villaescusa

Managing Director

*Javier Ramírez Villaescusa*

### READ ALL ABOUT IT – ELECTRONICALLY!

Try out the brand new features of our Poultry News, now with QR codes and hyperlinks!

Just click on these and read the latest, no matter where you are!



**9** Special Honour to Carlos Buxadé  
at our Franchise Distributor ...

- ① Get the QR-code reader (barcode) in your app store
- ② Scan this QR Code with your mobile device
- ③ Read Poultry News online





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# A MODERN ERA OF INNOVATIVE MANAGEMENT TOOLS HAS BEGUN!

If we consider the continuous genetics progress of LOHMANN birds in the past decades, confirmed through information on the pure line and Grandparent levels along with the performance data of parent stock and commercial layers coming from the field worldwide, the trend is clear. More eggs per hen housed, higher egg mass, better shell quality, prolonged production cycle, improved persistency and feed efficiency are among others some of the most important developments. This is why we talk about modern layers or so-called champions nowadays. For sure improved feeding technologies and superior management methods done by you as our respected customers, play a big role as well to reach outstanding performance results. Anyhow we would all agree that these LOHMANN birds deserve contemporary and up-to-date management tools adjusted to our modern world and present times. In these days it is almost impossible to imagine a life without our smart phones, internet and other modern IT-tools in day-to-day life. There's not a day without a new App on our smart phone which makes our personal and professional life easier in different aspects. Certainly poultry business is not an exception as well. On the other hand for any of us involved in this business it is certainly obvious that our daily deal with the flocks and being with and among birds cannot be replaced by our smart phones in our pockets. Nevertheless, the new tools can offer a great opportunity to improve our management tools for birds simplifying our daily routines in farm and office. This is one of the main reasons that LOHMANN gives a high value to innovative management tools since some years adjusted to our champions in field.

## E-Guides

A new era began some years ago introducing digital versions of booklets and guides with so-called e-Books and e-Guides. They can be easily read on a wide variety of devices anywhere, anytime with practical features. In this context, LOHMANN TIERZUCHT offers his customers for the first time a practical e-Guide available for different breeds. This e-Guide provides basic knowledge of how to manage LOHMANN birds along with additional information and videos. It is

also possible to switch easily between different topics or go directly to a page through table of contents or reading additional information via hyperlinks. On the other hand the e-guides are always up-to-date and available on our PCs or in our pockets preventing mass printing of old versions of management guides. The first e-Guide is available for LOHMANN LSL and LOHMANN BROWN varieties following a completely brand-new and very practical hatchery guide.

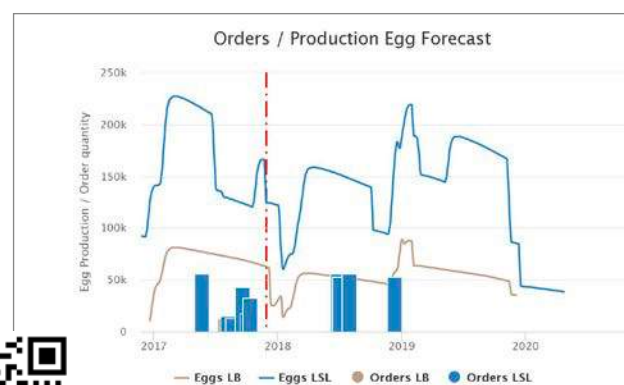
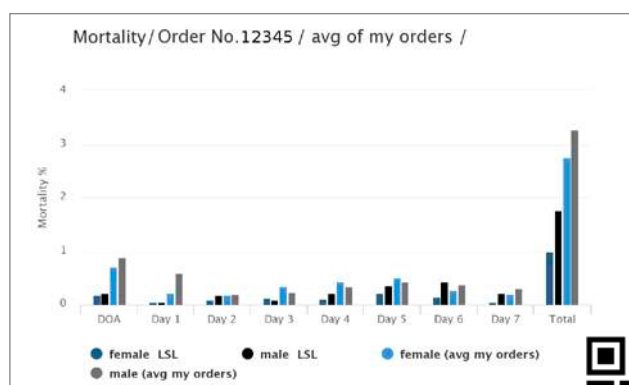
**The NEW  
E-GUIDE**  
now with VIDEO



## COP “Customer Order Processing”

The new Order-Online system of LOHMANN was introduced to you almost one year ago. Today all orders for parent stock flocks are done by our customers through this efficient tool. The benefits of this program for both sides are certainly clear. From easy ordering procedure of future flocks in advance without any delay and hindrances in-between to the overview of delivered flocks and forecast for the production are some of the advantages. The orders can be amended easily by customers and changes are immediately forwarded to relevant departments at LOHMANN main office for further

actions. New useful tools such as summary of first week mortality of delivered flocks have been added to this system. Furthermore the “Surplus” feature allows you to have the possibility of receiving more Day-Old-Chickens than originally ordered by you in case there’s a surplus of chicks on hatch day. Additionally all related shipment documents are as well uploaded to the corresponding order and available any time for customers through their account. We believe that COP contributes a main share of our goal to maintain our strong and successful business relationships with our customers.



## The Lighting Program App “LOHMANN LiPro”

Sexual maturity and performance of layers are substantially affected by the length of daylight during rearing and production. In systems where pullets are kept in windowless houses without access to the outside, lighting programs can be designed in such a way that optimal rearing and preparation for the laying period are guaranteed. However, still in many world-wide light-tight houses are rare and environmental controlled houses which have been constructed during the last years are often not fully light-tight. Lighting programs adapted to specific conditions are a valuable tool in the

management of highly productive LOHMANN birds. For example, it is very important to apply the appropriate lighting programs for the laying hens kept in new alternative systems such as free-range. For these kinds of housings a tailor-made lighting program has to be compiled. “LTZ lighting Program App” offers you the opportunity to make this possible set to the season, geographical location and the date of the hatch. This app is now available for iPad tablets and can be downloaded from Apple app store. The conventional version of the lighting program for PC is available for use as before.

### FSP "Flock Surveillance Program"

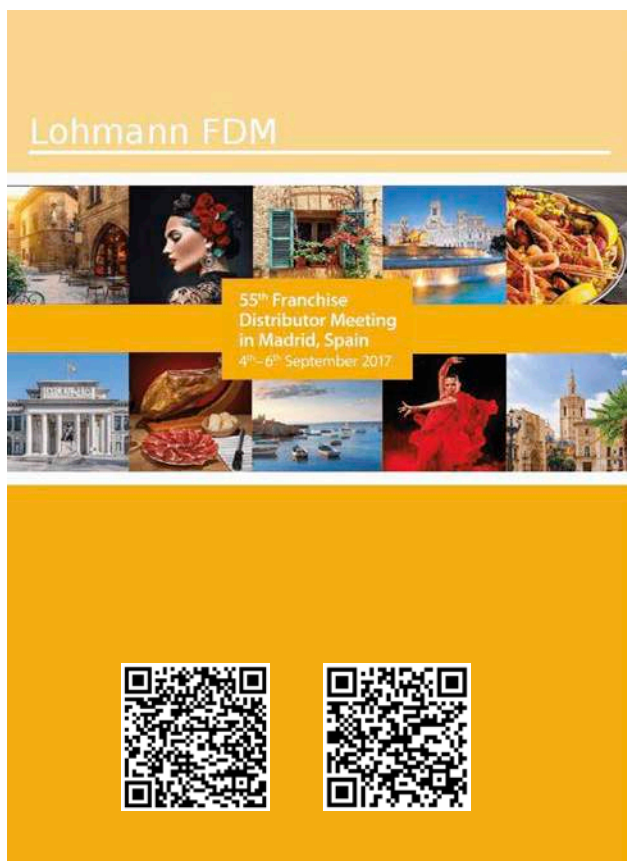
FSP-Online is another useful management tool developed by LOHMANN. This online tool as a replacement for old Excel-Sheets and first week mortality reports, allows you to easily enter the corresponding information of a delivery such as arrival times, house temperature or mortality rates. The information can be updated

daily upon arrival of the chicks. You may upload pictures, videos and add your comments using this link, as well as data logger files. This tool has been permanently updated for a smooth usage and with new features. The online link for using this tool will be sent to customers on hatch date by E-Mail.

### FDM App

This App is known well for the ones who participated in our last distributor meetings in Japan and Spain. All important information such as registration form, seminar program, flight advices etc. are implanted in this program. For the first time we tried the new

feature of live chats during the workshops with a positive feedback from your side. This App will be updated for all upcoming Franchise Distributor Meetings of LOHMANN in future.

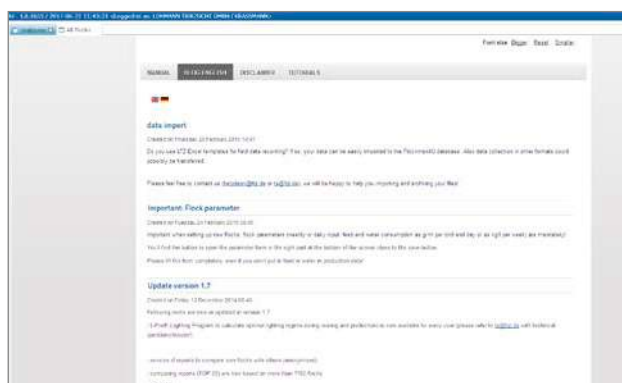




## Flockman 4U

Since many years LTZ provides Excel templates and production charts to keep track of performances commercial and parent stocks. Flockman4U as a modern alternative program is a web-based managing and monitoring tool for parent stock and commercial flocks to easily collect and record data of different flocks. Single flock results are shown as graphs and

tables which can be easily compared with target standards. A peer report ranks the customer's own flocks and an anonymous comparison with similar flocks in the database is a valuable and interesting evaluation for the farmers. The Lighting Program software for open houses is implemented in this program as well.



## Specification App

Body weight development in the rearing, production per hen/day, egg weight, livability or the cumulative eggs mass are some of the most important parameters for an egg producer to optimize the performance results. For the parent stock farmers also the detailed information on the performance, number of hatching eggs and especially saleable chickens at different ages of

the birds could be some of the main parameters to have a look on that. This App offers a unique opportunity to compare your results with standards of LOHMANN commercial layers and parent stock including details and charts. This app is available for Android and iOS devices on Google Play store and Apple app store.



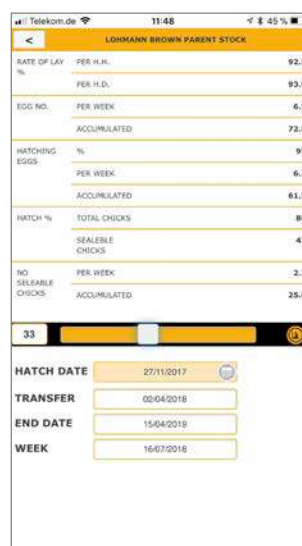
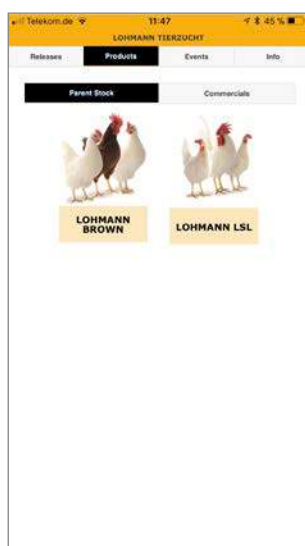
App Store



google play store



App Store



Farhad Mozafar

# LOHMANN PLANNING & LOGISTIC TEAM

Have you ever thought about what happens between the hatchery and the farm? The path day-old chicks travel from door to door?

The LOHMANN Logistic Team has, of course! The result is a focused presence everywhere in the world as this is potentially the most risky part of the journey for the chicks you have ordered and an essential element of being able to safely arrive at the destination from A or B or C.

## Support from hatchery to farm

In recent years, the global situation regarding avian influenza has increasingly forced us to discover new ways of supplying our customers from our existing or new sites.

The team worked out new gateways but also came across new difficulties such as third parties who are involved in the process but lack sufficient knowledge of poultry, as well other challenges. The team took on a proactive role and used their expertise to smoothly support the route from the hatchery to the farm.

## Knowledge and presence improve transport

Previously, routine flights were booked by head office. Now, however, this process is done from a mobile office so that all the stakeholders around the world are involved as active participants. The links in the chain include our experts at airports, warehouses, airlines, transport companies, veterinary authorities and our customers - all with the common aim of improving the knowledge levels of everybody who is involved in transporting and handling our day-old chicks.

You may meet one of us next time when your LOHMANN chicks arrive at the airport or your farm.

## Needs of the chicks

Without information, other people cannot possibly know the precise needs of chicks, the issues that have to be considered be-

fore, during and after transport and the all-important environmental factors such as ventilation, temperature and humidity. From our position in the poultry sector, we have to supply this information. In a highly critical transport process, we work with partners who, for 90% of the time, normally handle other, non-perishable goods. These people need to be trained and given increased awareness of the sensitive needs and habits of livestock in transit. And new born chicks belong to the most difficult category.

## Globally connected

So, we transported our desk from the office and now work surrounded by those new partners. We share, we train, we see, we change, we adapt. Thanks to mobile phones we can be 'present' in multiple regions of the world to deal with different issues at different time zones all at the same time. This tool makes it possible to practically connect the entire world 24/7. Rapid and almost immediate contact with support using photos, video clips or contact allows us to be virtually everywhere, standing alongside





## Different challenges, different solutions

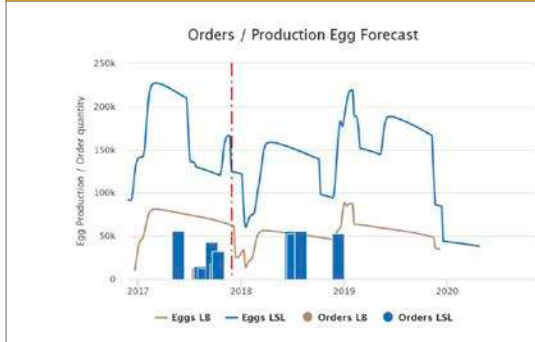
We have reached out to include and involve "outsiders" as part of our team. We intend to actively continue this process and use our presence to raise the levels of commitment of newcomers to our world – the route between hatchery door and farm

## Customer service from door to door

You are invited to use this service for your next delivery. The service is easy to use and offers triple benefits: for you, for us and for the chicks.

Together we form a stronger team between the hatchery and the farm. We would like to invite you to join our team so we can learn from you and help outsiders to handle our chicks better.

Café Corporate Information				
Monthly Data report				
FY 2020				
Customer quantity	Persons			Notes
Estimated quantity	10,000			1,000
Direct target avg.	10,000			1,000
Direct sales avg.	10,000			1,000
Rate	10,000	10,000	10,000	10,000
Step 1	10,000	10,000	10,000	10,000
Step 2	10,000	10,000	10,000	10,000
Step 3	10,000	10,000	10,000	10,000
Step 4	10,000	10,000	10,000	10,000
Step 5	10,000	10,000	10,000	10,000
Step 6	10,000	10,000	10,000	10,000
Step 7	10,000	10,000	10,000	10,000
Total	10,000	10,000	10,000	10,000
Support Role and others				
MIND DATA				



# VAMOS A ESPAÑA!

## 55<sup>th</sup> Franchise Distributor Meeting in Madrid, Spain 'Globally connected with LOHMANN'

'Globally Connected with LOHMANN' was the motto for this year's Franchise Distributor Meeting in Madrid, attended by almost 160 representatives from 45 some nations.

### Welcome to Madrid!

Monday evening was the kick-off with a reception at Madrid's impressive Casino. Our Managing Director Javier Ramírez welcomed the guests and there were speeches by several local politicians (names - Andrea?). Traditional Spanish dishes provided a suitable culinary background, while our guests enjoyed the warm atmosphere of the historical casino.

### Globally connected with LOHMANN

The motto 'Globally Connected with LOHMANN' was viewed from every conceivable angle, on the first seminar day. Based on this subject, a number of presentations were provided by our own specialists and external experts including Dr. Carlos Buxadé and representatives of Spain's public health authorities.

In the afternoon, we travelled a short distance to the Palacio del Negrlejo where our guests enjoyed a culinary tour of Spain's many regions, in delightful surroundings, culminating in a series of traditional presentations including a flamenco show. In the evening, there was space for even more culture at the Museo del Prado in the form of a private tour of the exhibition galleries, followed by a cocktail dinner.

### One challenge – one opportunity

On the second seminar day, it was time for our customers to take the floor. Under the motto 'One Challenge – One Opportunity', they spoke of their experiences and successes. These provided the subject matter for a subsequent round of discussions on how to overcome and exploit the crises in the poultry business. Around lunchtime, we travelled by bus to the traditional Café de Oriente, where the seminar visitors enjoyed their lunch while soaking up the seasonal weather and fabulous view of the Palacio Real, just opposite. Lunch was followed by a 3-hour guided tour on foot through the magnificent historical city centre of Madrid. The evening of the final official seminar day concluded with our gala dinner with live music. A successful end to a successful seminar. For most of us, Thursday meant 'Adiós Madrid'.

### Valencia here we come!

For a number of seminar visitors, however, the journey was not yet over. Instead they started their additional tour to Valencia. After a journey of just less than 2 hours on the high speed AVE train, our stay in Valencia started with a 3-hour guided tour of the historical parts of the city. The afternoon was free for delegates to continue their own journey of discovery around

Valencia, or to simply soak up the warm summer weather on the magnificent sandy beaches.

In the evening, a barbecue dinner was organised at Hotel las Arenas, where the mood was further enhanced by a musical concert.

A variety of choices were offered for spending the Friday morning. Options included a visit to the City of Arts and Science and the Park by bicycle, or by bus, followed by a lightning visit to Valencia's opera house.

The motto for the afternoon was: 'Bring on the wooden spoons! The objective was to produce a delicious paella in the magnificent villa Masia Xamandreu. A great time was had by all, and the best paella was offered up for tasting. The final evening was spent at the marvellous location Veles e Vents where everyone enjoyed a pleasant end to the conference with a standing cocktail dinner, before heading back home on Saturday.

### Muchas Gracias

We would like to thank all those who attended for a wonderful time in Madrid and Valencia, and express the hope that all our guests enjoyed the conference as much as the LOHMANN team.

*Marketing*



## SPECIAL HONOUR TO CARLOS BUXADÉ AT OUR FRANCHISE DISTRIBUTOR MEETING 2017 IN MADRID

### Poultry, Sustainability and Future

Prof. Dr. Carlos Buxadé Carbó presented an excellent summary on the future needs for farm animal production with a special focus on poultry during the Franchise Distributor Meeting in Madrid at the beginning of September 2017. Feeding the growing population of the world requires joint efforts to improve feed efficiency and performance profile especially when arable land is shrinking all over the world.

### Honour of lifetime achievements

After his presentation and discussions with the audience, Prof. Dr. Ernst Kalm, former chair of the Institute for Animal Breeding and Husbandry at the Christian – Albrechts University (CAU) in Kiel, Germany, personally honoured the lifetime achievements of Carlos Buxadé.

### Scientific career

Buxadé graduated with a degree in animal science at the University of Madrid and started his scientific career at the university in Kiel. Even Prof. Dr. Preisinger, Dr. Schmutz, Dr. Wiebke Icken and Dr. Cavero, attained their PhD degrees from this university under the then leadership of Prof. Kalm.

Buxadé received a fellowship from the

university in Kiel in 1969. In 1971, he finished his PhD studies on growth pattern and carcass yield in pigs. From 1971 until 1973, he worked as a Postdoc in the milk recording centre in Kiel.

In the years to follow, he worked for the animal nutrition company, NANTA - España in Spain.

In 1985, he went back to Kiel to further pursue his studies in order to apply for a Professorship. He attended congresses and organised a lot of excursions to Germany for Spanish dairy and pig farmers. He successfully received his Professorship in Madrid a few years after.

Based on his excellent and fond experiences with the university in Kiel, he encouraged and sent more than 15 PhD students from Madrid to Kiel and all of them have graduated at that very same university in the last 30 years.

### New challenges

The number of publications and books which Carlos has produced is very impressive. His emotional and energetic way of presenting different topics related to farm animal production, with a special focus of economics, is well appreciated in Europe and Latin America.

After retiring from the University in Madrid, Carlos has decided to start his own consulting company, a move that did not come as a surprise to his friends. Carlos needs the challenge and he is very eager to push our industry into further horizons.

All of us wish Carlos all the best for the future and we are certain, we will meet him again in future events in which he will most likely continue to present the latest results and recommendations in his unique and passionate way.

*Prof. Dr. Rudolf Preisinger*







## 55<sup>th</sup> Franchise Distributor Meeting in Madrid, Spain 'Globally connected with LOHMANN'











# Additional Tour Valencia









# LOHMANN SCHOOL 2017

**A**nother edition of our LOHMANN SCHOOL took place in Cuxhaven from 8-11 May. A total of 39 participants from 23 countries accepted our invitation and joined the seminar. Our technical service team prepared an interesting and informative programme for our guests who stood to benefit a lot from the one week of training.

## Welcome

The programme kicked off with a welcome dinner on Sunday evening, so participants had a chance to get to know each other before the seminar started the next morning.

## From management to feed and water

On Monday, different lectures were held on housing and brooding, rearing management, production management and hatching egg handling.

On the second day, the main theme was feeding, feed formulation and water. In addition to handling technical issues, we also made sure there was time to relax! We organised a trip to our neighbouring city Bremerhaven in the afternoon, where everyone had some free time for sightseeing or shopping.

## Veterinary issues

Our vets took the lead on Wednesday and discussed the vaccination of PS and commercials and important diseases in the modern layer industry. In order to deepen the knowledge on the recurrent topic of hygiene and biosecurity, we prepared a combination of presentations and a workshop. In the evening, the participants' singing voices were put to the test at our karaoke session after a group dinner.

## Final day in Cuxhaven

Thursday, which was the final day in Cux-

haven, did not focus on a single topic. The participants were informed about production management, poultry red mite and LOHMANN genetics and breeding. Our "Flockman4U" program was also introduced and the participants had the opportunity to gain some practical experience. Finally, our managing director Mr. Ramírez closed the meeting with his general presentation on LOHMANN. The final day of the seminar concluded with a dinner during which the certificates of attendance were presented.

## Excursion

Next morning the group had an excursion to Big Dutchman. Afterwards, they travelled to Bremen for some free time for shopping, sightseeing or just relaxing.

It gives us great pleasure to conclude that this year's edition of the LOHMANN SCHOOL was once again a great success!

*Marketing*







# LOHMANN CHINA SCHOOL AND CP CHINA TRAINING SEMINAR

On 22 and 23 May, our LOHMANN CHINA SCHOOL took place in Beijing, China and following this event, our experts joined the CP CHINA TRAINING session which took place on 25 and 26 May.

## Internal and external experts

Participants from all over China accepted our invitation and attended the LOHMANN China School. During the two days of the seminar, a rich and diverse training programme was offered by our technical service team which included Dr. Atoussa Mazaheri, Robert Pottgueter, Ron Eek, Gimmy Wu and Zhongfeng Qiao. Experts from Petersime (Jackson Hung), MOBA (Terry Li), Merck (Denis Yau), De Heus Nutrition (Jan Cortenbach) and Big Dutchman (Mark Ma) were also invited to share their knowledge with our customers.

## Seminar and exchange of ideas

The first day featured various lectures on genetics, hatching, egg quality, diseases, vaccination and bio-security. After a full day of sessions on day one, the participants and lecturers enjoyed a traditional

Chinese meal so they all had a chance to share their ideas.

On the second day, the sessions concerned feed, layer and breeder nutrition, GP and PS management, commercial stock management and environment control.

To conclude the sessions, certificates of attendance were handed out. In the evening, two days of training were successfully rounded off with a farewell dinner.

## CP CHINA TRAINING SEMINAR

Following the training sessions, our technical service team was invited to speak about the training at an event organised by our customer CP China.

The speeches were prepared in line with the participants' specific requirements and focused on eggshell quality and benchmarking management.

We are very honoured to have had this opportunity to share our knowledge with our customer as a way of guaranteeing a successful business relationship. We hope we will meet again in the future so that we can share more of our experiences and expertise with our customers.

*Jimmy Wu*







## LOHMANN HATCHERY COURSE 2017 UNDER NEW MANAGEMENT

In early August (7-11 August), we welcomed many customers from all over the world to our LOHMANN HATCHERY COURSE 2017.

It was the first time that our colleague Davide Assirelli, a member of our Technical Service Team and our incubation specialist, was responsible for the seminar programme.

### Hatchery business as usual

As usual the LOHMANN HATCHERY COURSE concentrated on hatchery-relevant issues. This time our various hatchery managers were given an opportunity to hold presentations on egg storage and S.P.I.D.E.S., egg handling and setting as well as hatch windows and chicks process.

### External experts get the chance to speak

In addition, a number of external speakers

were invited to give an overview of special topics. Dr. M. Boerjan, Pas Reform, talked about embryonic development in the hen and incubator/fundamentals of incubation and age of breeder hen, hatching egg, embryo and chick quality. The topics of ventilation in the hatchery and S.P.I.D.E.S. technology were presented by Mr Baker and Mr Hodgest from EMTech. Mr J. Cormick, Petersime, talked about the relationship between incubation and chick quality and Mr Abrahams from Emka informed the participants about egg weight loss and dry hatch.

### Fun and leisure

In addition to discussing technical issues, we also made sure that fun and leisure were in plentiful supply. We organised a bowling contest and the participants' sin-

ging voices were put to the test at our karaoke session on one of the evenings.

### Final excursion

The LOHMANN HATCHERY COURSE was rounded off with an excursion to the Netherlands, with an opportunity to visit TerHeerdt and HatchTech.

### Breeding for success – together!

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*





## PRODUCTION MANAGER SEMINAR 2017

Another cherished event on the extensive LOHMANN Calendar of Events is the Production Manager Seminar, which is held every two years. The seminar can be summed up as a successful combination of sport and lectures. This time the meeting took place from 23-26 April in Obergurgl, Austria.

### Start up

Prof. Preisinger welcomed the attendees to the seminar before everyone enjoyed dinner together. On Monday morning, skiing was on the agenda. After this exercise in the fresh air, everybody was geared up to concentrate on the different lectures in the afternoon. The day's topics were worldwide proposed methods of sex determination, options for applications in a commercial hatchery, growing males from commercial layers and the dual purpose bird.

### Sport and technical

Continuing the successful combination of a sporty morning and a technical afternoon, Tuesday also started with some fun on the slopes. Afterwards, Davide Assirelli, Dr. Matthias Voss and Dr. Anke Förster talked about optimised hatchery procedure for LSL and LB, vector vaccines for commercial layers and Flockman4U – parent stock and commercial. A general discussion on all topics concluded the lecture programme.

At dinner on the last day, the LOHMANN team and the participants reviewed the last three days in an informal setting. We hope that everybody enjoyed the stay in Obergurgl.

*Marketing*

# 10<sup>TH</sup> ANNIVERSARY of LOHMANN SCHOOL RUSSIA



**T**his year's LOHMANN SCHOOL Russia took place on 19-22 June in Yekaterinburg. Specialists from high-volume egg poultry farms in Russia and neighbouring countries actively participated in this event.

## Audience

The number of participants was almost 100 and the audience showed keen interest in the lectures. The range of topics covered the technology of housing, animal health and feeding as well as the characteristics and needs of LOHMANN's breeding products. There was also an opportunity to discuss numerous practical questions, such as the rationality and efficiency of

forced moulting, lighting, balanced feeding etc. In addition to the lectures, a round table session was organised. The participants could ask specific questions, exchange experiences and get the opinion of the LOHMANN experts.

## Birthday Atmosphere

There was not only a working, but also a festive atmosphere, as it was the 10th anniversary of the LOHMANN SCHOOL Russia! Many of the participants had already received a certificate of attendance before and willingly shared their experiences and memories. Even the weather did its best and during the festive banquet on the

banks of the river Sysert, we successfully ordered sunshine!

It was not purely by coincidence that the Jubilee School was held in Yekaterinburg, because 22 years ago the first parent stock chicks were supplied to PF Sverdlovskaya from Germany. That signalled the successful entry on the CIS market.

We hope that all the participants went home with more knowledge and insight and look back on an enjoyable programme with plenty of unforgettable impressions.

We are really looking forward to welcoming you at our next LOHMANN SCHOOL event!

*Galina Scholz*





*Hello! Thank you very much for the event. LOHMANN's specialists have an enormous amount of knowledge and practical experience. I myself noted 20 or so points about poultry management to improve the results of production activity. I thank the speakers for their sincere desire to share their accumulated experience and develop other people.*

*The round table format is very important and often provides insights, but unfortunately we could not attend this meeting because we had to leave. Hence the desire to audio or video record the presentations and discussions. For the next LOHMANN SCHOOL it would be very interesting to look at management in rearing replacement chicks: evaluation of plumage development and the size of internal organs, evaluation of uniformity and ways to increase it, starting period, feeding, etc.*

*Special thanks to the event organisers for the warm welcome and attention to each participant!*

**KOLOMIJCEVA YELENA PF BELYANKA**



*I wish to express my gratitude to your team for these seminars, for this opportunity for young professionals like me, who are just beginning their career in poultry rearing. At the school you can learn about the innovations, get acquainted with the practice of other businesses, discover something new, and just relax.*

*The "Questions Box" really helped me, I asked a few questions to which I now know the answer and know how to develop myself further. There were interesting topics such as management of poultry farming, biosecurity, forced moulting, the external and internal qualities of eggs, non-contagious diseases. This was my first LOHMANN SCHOOL! In the future I hope to attend more of these seminars, put on by you! Maybe soon I will make my own report!*

**ERIKKYZY AYGERIM, PF KOGER**



*I am happy that I have been able to work for so many years with LOHMANN TIERZUCHT. I was there at the very beginning when this bird was imported to us in Russia. And as far as the bird itself is concerned, I am strongly convinced that the LOHMANN is the best bird in the world!*

**VLADIMIR GRIGOREVICH BURUN, PF SVERDLOVSKAJA**



*As always it was interesting to meet all the participants in the School and to hear the latest presentations.*

*The LOHMANN SCHOOL had a very rich and useful content and at the same time had the friendly atmosphere of a home school. I very much liked the idea with the "box", specialists cannot always ask questions orally but we saw a whole stack of written questions!*

*I can still see the lovely venue of our evening at the lake! Unforgettable! The evenings you organise always stay in the memory.*

**ALLA MYKHAMEDSHINA, DANLEN**







# LOHMANN TIERZUCHT ON VIV RUSSIA 2017

**V**IV Russia 2017 took place in Moscow from 23-25 May. It is the leading trade event for animal husbandry and processing in Russia. This multi-discipline event includes the poultry meat, egg, pig meat, veal and dairy sectors.

## Ultra modern booth

LOHMANN TIERZUCHT took part at this trade show for the first time with a new, ultra-modern booth measuring 100 m<sup>2</sup>. The event was a great success and we were very pleased to meet a large number of valued customers and potential business partners.

## Collaboration to meet market demands

Our strength lies in our close collaboration and, by working hard, we make our brand even more successful. In order to meet our customers' demand, our genetic lines fit in every imaginable market as expressed by our slogan: "For every market the right egg, for every management system the right hen."

We would like to express our thanks for everyone's visit and hope to meet again in the near future.

*Marketing*





## REGIONAL HATCHERY » GUATEMALA «

Incubadora Regional S.A. has been LOHMANN's exclusive distributor in Central America since 1991 and the company started work on a new farm for parent stock in 1998, building on their steady and sustained growth. The farm is one of the most modern and efficient in the region, with strict health and biosecurity controls.

Despite the outbreak of low pathogenicity avian influenza in 2001, Incubadora Regional S.A. parent stock has never been vaccinated against H5N2 avian influenza.

### New hatchery

In 2017, Incubadora Regional S.A. will finally complement their efficient production system with a new hatchery, where production has already started in December. The first hatch will be on January 1st, 2018. One of the main innovations will be the plant's roof, which is made entirely of concrete, and solar panels installed

on this roof will produce 100% of the plant's electricity supply. The plant will have the capacity to produce 10,000,000 Lohmann chicks a year.

### Wide distribution

LOHMANN LSL CLASSIC and LOHMANN BROWN CLASSIC products will be distributed to Guatemala, El Salvador, Honduras, Costa Rica, Nicaragua and Panama from 2018.

Incubadora Regional S.A. supplies the Central American market with quantity and quality, providing the best technical support and fostering a sense of passion and competition amongst our clients. Roberto Ordoñez, the company's president is emphatic as he declares: „LOHMANN is the best and most profitable layer in the world.”

*By Roberto Ordoñez and Thomas Calil*



*Photo: from left to right: Matheus Alves and Braulio Ruiz, sales and service managers for Latin America; Thomas Calil, regional manager for the Americas; and Roberto Ordoñez, president of Incubadora Regional S.A., at their new hatchery.*





*Photo: the LOHMANN Avícola de México team. From left to right: Francisco Paco Medina, sales director; Omar Lopez, director general; and Pascual Alonso, Lohmann Mexico project coordinator.*

## LOHMANN AT THE LATIN AMERICAN CONGRESS IN MEXICO

**L**OHMANN TIERZUCHT attended the 25th Latin American Congress held in Guadalajara (Mexico) from 26 to 29 September 2017.

### **Important for the poultry sector**

The Congress was an important gathering place for the poultry sector, welcoming poultry producers not only from Mexico but from all over Latin America. Representatives were also drawn from a wide range of different businesses within the sector, including pharmaceutical and biological laboratories, nutrition and pre-mix companies, equipment suppliers, and genetics companies.

### **Contacts**

We have made a considerable number of contacts with various Mexican egg producers via our LOHMANN LSL (white), Rancho Grande and LOHMANN Avícola de México distributors, and our LOHMANN LB (brown) distributor Avicola Jocef. Clients and distributors from countries such as Colombia, Cuba, Chile, Peru, Bolivia and Guatemala also flocked to our stand to find out more about the latest developments in our genetic line.

The Congress also offered a wide range of technical presentations in different disciplines, including nutrition, health, and management.

*By Pascual Alonso and Thomas Calil*





# Samundri Chicks LSL-Ultra Lite Seminar IPEX Lahore Pakistan

**L**OHMANN customer Samundri Chicks Pvt LTD organised a seminar at the International Poultry Expo (IPEX) in Lahore Pakistan on 25 August. About 70 progressive, commercial layer farmers from across the region participated in the event.

## Seminar content

There were three speakers at the seminar who shared valuable information regarding good chick quality, modern layer management and economical management of laying hens.

Dr. Munawar Hussain, Regional Sales Manager South Samundri Chicks Pakistan Pvt Ltd, delivered the welcome address. The first presentation was delivered by Mr Denial Abrahams, Sales Director of EMKA Incubators Belgium, who provided useful knowledge on good chick quality and dry hatch. The second presentation was given by Dr. Sohail Habib Syed, Area Sales and Service Manager of LOHMANN TIERZUCHT GmbH Germany on modern layer management with an emphasis on rearing management.

Mr Ron Eek Regional, Sales Manager Asia, gave the third presentation on economical management of laying hens.

The question and answer session was followed by presentations by Dr. Maqsood Jaffri who answered the technical questions asked by various layer farmers.

## Chief guest

The chief guest at the seminar was Mr Aamir Razzaq, chairman of the Layer Farmers' Association and convener of the layer division of the Pakistan Poultry Association. He thanked Samundri Chicks Pakistan Pvt Ltd and LOHMANN TIERZUCHT GmbH Germany for providing a unique opportunity to layer farmers to adopt a scientific approach in modern poultry farming. He also emphasised the need to educate the general public regarding egg consumption per capita. Eating eggs can help alleviate hunger and poverty in the country.

The vote of thanks was given by Dr. Shahid Iqbal, CEO of Samundri Chicks Pakistan Pvt Ltd.

All the guests were entertained with refreshments after the seminar.

*Dr. Sohail Habib Syed*





As everyone is aware, the Chinese Animal Husbandry Exhibition (CAHE) is the one of the largest and most important annual husbandry events in China.

#### Facts and figures

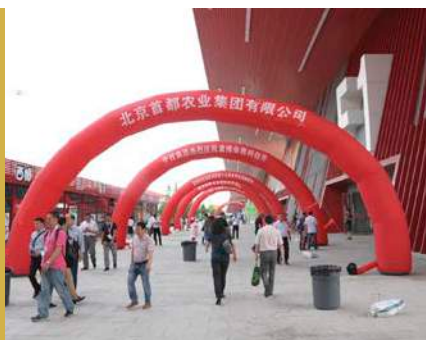
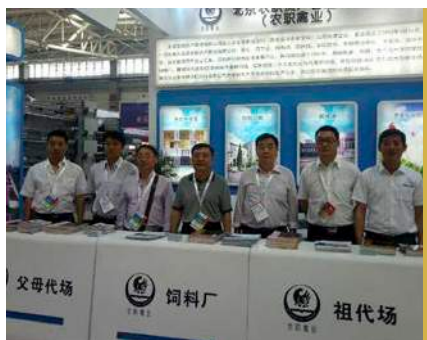
This year, the 2017 edition of the CAHE attracted 161,655 visitors and 1,200 exhibitors from 38 countries and regions. The exhibition area reached a new record of 120,000 square metres. Various embassies and international organisations hosted national pavilions at the CAHE, including the

Holland Pavilion, Denmark Pavilion, French Pavilion, UK Pavilion, Canada Pavilion and USA Pavilion. Participants also included nearly 150 other leading companies from the USA, Germany, Australia, South Korea, Japan, Israel and Turkey. International participation reached 20.68 %.

#### Gratitude

LOHMANN TIERZUCHT were pleased to participate at this event and met many valued customers and potential business partners. We would like to express our gratitude for everyone's visit and hope to meet you again in the near future.

*Jimmy Wu*





# MYANMAR

## ★ THE GOLDEN LAND ★

Since 2011, the Myanmar government has launched a programme of political and economic reforms and initiated important investments in trade and the economy. Financial measures have also been introduced, including a unified exchange rate system, a new foreign investment law, relaxed import and export restrictions, and the implementation of a minimum wage; all measures aimed at attracting the attention of global investors. Following the first democratic elections in 2015, ethnic and religious disputes and the huge gap between rich and poor have become the focus of political and economic reforms, but despite this, Myanmar is still the golden land for investments in the coming decades.

### First impression

The first impression of the country on arrival in Yangon is the crowded traffic, but without any motorcycles, and the unbelievable sight of both right-hand and left-

hand drive vehicles zooming along side by side on the right side of the road. Yangon's split personality traffic is like the current situation in Myanmar: political reform and economic liberalisation is the vehicle that has already driven ahead at high speed, the powers that be are like the left-hand drive cars and the right-hand drive cars have started a tournament in this once peaceful Buddha road.

Myanmar's basic infrastructure, financial system, and the general living conditions still lag far behind, especially in the countryside, but almost everyone in Myanmar has a smartphone with WiFi for Google, Facebook, to browse the web and send emails. So in that sense, Myanmar is connected to the world in its own way. Of course, it is handy to buy a SIM card or switch the roaming function on to call your family or friends when you arrive Yangon.

### United Layer Breeder Road Show

Along with economic liberalisation and

development, the demand for animal protein, including table eggs, is increasing with large, brown table eggs popular among consumers and commanding a premium price. The poultry sector in Myanmar is showing incredible growth across the board and our loyal Myanmar distributor United Layer Breeder (ULB) is one of the leaders in this explosive wave. ULB was established in 2011 and they have acquired huge success through their reputation for providing good quality day-old chicks and reliable technical support as the local layer producer. In June 2017, the LOHMANN Asia team was very honoured to be invited to speak at their annual national road show, where they shared LOHMANN BROWN rearing management skills and provided disease control and biosecurity measures.

Today's Myanmar is busy actively reviving its former glory and LOHMANN is honoured to supply ULB to help achieve a historic milestone in Myanmar's layer market.

*Chien Ming Wu*





# State of the art hatchery opens to supply Australian egg farmers

Specialised Breeders Australia (SBA) is the largest supplier of day old chicks and point of lay pullets to the Australian egg industry. Based close to the Victorian city of Bendigo and employing more than 140 staff, SBA supplies the world's leading layer breeds, Hy-Line Brown and LOHMANN BROWN to Australian egg producers.

## Custom designed hatchery in Rochester

A company press statement released on May 8 announced production had commenced at a custom designed hatchery in Rochester, Victoria.

This hatchery is the culmination of more than five years of sourcing, design and construction work and will provide Australian egg farmers with a secure supply of high quality livestock for decades to come.

Richard Rayner, CEO of SBA, explained "We have been able to take advantage of recent advancements in single stage incubation technology and a new process known as SPIDES (Short Periods of Incubation During Egg Storage). These improvements result in more consistent, better quality hatches which means a dependable supply of high quality chicks for our customers. The new hatchery has been designed with an eye to the future, allowing for rapid capacity expansion into the existing structure and site planning permission in place to double capacity through further development."

"The \$19 million project has been completed using Petersime Incubators and Ecat

automation from Belgium and France respectively and contractors from around regional Victoria.

"Designing a new hatchery from the ground up has given SBA the ability to create a state of the art facility with world class bio-security, including an off-site truck and chick basket wash, alongside the best available chick processing technology to ensure efficient processing at the highest possible welfare standards," Mr Rayner said.

## "Welcome to the world's newest hatchery,"

The new hatchery will be staffed by a mixture of workers transferring from SBA's existing hatchery and residents of the Rochester district. "Welcome to the world's newest hatchery," said Mr Rayner, when welcoming guests to the new Rochester facility on March 30. "We thought that this would be a good opportunity to show you around before we go into biosecurity lock down. "The facility features the latest and most advanced hatchery design and technology and the company is both ISO and HACCP accredited.

"Apart from being the leading supplier of layer genetics with the world's best two layer breeds, SBA supply Seqirus (formerly CSL) with hatching eggs for human flu vaccine manufacture. "Our market share of layer genetics rose to 65% in 2016 and is projected to continue increasing" he said. "There is the question of our responsibility as a critical supplier to the layer industry where biosecurity, supply continuity and redundancy are our paramount concerns."

## Biosecurity and key risks

In defining differences between existing hatchery infrastructure and the new Rochester facility, Mr Rayner identified key risks as being the hatchery and production site on the same location and trucks and chick baskets returning to the hatchery. The new direction for SBA, to reduce risk and increase security, involves a new hatchery and four parent stock farms with a significant biosecurity buffer between each operation.

"A remote truck wash and delivery basket sanitation depot and three new chick delivery trucks with state of the art Van Ravenhorst bodies with increased systems

back up capability." These trucks have two generators to ensure that a stable temperature can be maintained for the chicks at all times. The trucks cover some of the greatest distances on the planet and operate in temperatures from cool temperate in the south to tropical conditions up north.

### Research for design and equipment

"There have been years of research devoted to selecting the best design and equipment for our new hatchery with the key aims of improving chick quality, hygiene levels and having the ability for future expansion. "We experienced 12 months of delays due to objections and VCAT interventions," Mr Rayner explained. "The design parameters were to employ the best available incubation and automation technology and achieve the best process flow and building hygiene.

"We wanted to use the best possible heating, ventilation and air conditioning (HVAC) for optimum conditions and airflow direction. Water sanitation is also of critical importance.

"SBA partnered with Petersime for a number of reasons including the fact that they were technologically advanced, offered good back up and support in Australia, are easy to clean and energy efficient. "Most of all however, is that we believe their product will produce the best quality chicks.

### New Systems

"The single stage design feature of the Petersime equipment is superior to multi stage incubation, offers better single batch control with a tighter hatch spread delivering better hatchability, better chick quality and better liveability."

Mr Rayner went on to explain the "short periods of incubation during egg storage (SPIDES) delivered a more even start to incubation, better hatchability, better chick uniformity and required less donor flocks per placement".

ECAT Automation is a French based company producing hatchery handling systems for small, medium and large scale operations. "Our new ECAT systems mean

less manual handling of eggs leading to better hatchability and improved chick quality," Mr Rayner explained. "The systems consist of auto trolley, tray and basket washing, drying and sanitising to improve hygiene levels. "Efficient and accurate chick handling which includes technologically advanced chick counters delivers accurate chick numbers per box delivered to our customers. "In a modern and hygienic hatchery, ventilation and air flow is of critical importance. "In our clean to dirty airflow strategy we have the highest (+ve) pressure in cleanest areas and lowest in dirtiest areas.

### Maximum possible building hygiene

"Achieving maximum possible building hygiene, involved detailed design planning and some major investment.

"Floors are not bare concrete which can degrade but epoxy sealed.

"All drains and automation equipment are fabricated in stainless steel. There is movement sensitive lighting (no manual switches) and no conduits or power points on wall surfaces and finally there is a ring main sanitation system," Mr Rayner said.

"The new facility will have a capacity of 14 million chicks a year and the design allows for extra incubators within the existing building in order to double that capacity as market demand grows. "Planning approval is in place to extend the building when required in order to increase capacity and we can move to four day hatching and use the same processing areas and equipment. "New farm sites will also contribute to our ability to double current capacity.

"So we have a new hatchery, new farms, new trucks and a dedicated truck and chick basket sanitising depot.

"All this will improve our quality, biosecurity and capacity to supply a growing industry," Mr Rayner concluded.

With the friendly assistance of Peter Bedwell, Poultry Digest and SBA Australia.

**With the friendly assistance of Peter Bedwell, Poultry Digest and SBA Australia!**





# WASTE MANAGEMENT AT IBERTEC: SEIZING OPPORTUNITIES

The management of waste from any livestock operation, and especially hatchery waste, has undoubtedly caused a crisis situation and brought warnings of collapse. This has forced the hatchery sector itself to work diligently to discover the industrial processes that have enabled a large part of this waste to be included in the by-product category, with its associated value. This is how the hatchery sector has transformed a cost and a problem into an income and a business opportunity, and we at IBERTEC have done the same in Spain, at a hatchery producing 15 million LOHMANN chicks a year.

## Quantifying waste generation

First, we are going to review the quantities of waste generated in a hatchery. When we load our incubators with 100 eggs at 58 g each, we get:

- 40 female chicks at 38 g each.
- 10 clear eggs at 51 g each.
- 10 unhatched eggs at 46 g each.
- 41 males at 39 g each.

We can express these quantities per female chick, or per 100,000 female chicks, produced. This is the number that we usually hatch in our hatchery per hatch day, so for each 145 g of hatching egg per female chick, or 14.5 t per 100,000 female chicks, we get:

- 38 g of female chick or 3.8 t per 100,000 females
- 78 g, or 7.8 t, of waste split between:
  - 13 g or 1.3 t clear eggs.
  - 13 g or 1.3 t egg shells.
  - 12 g or 1.2 t unhatched eggs.
  - 40 g or 4.0 t male chicks.
- Water vapour: we must remember that the hatching process dries the hatching egg to its optimum level to produce a fully-developed day-old chick.

- Heat: this is generated in the last few days of the process and we recover it for use in our daily hatching operations.

As we can see in Figure 1 above, the weight of waste produced is double the weight of the day-old female chick, so a more detailed analysis of the management of each type of waste is required, starting with the male chicks whose weight exceeds 50% of the total waste produced. This management exercise will obviously require this waste to be recovered and categorised as a by-product.

## Male chick processing and recovery

This process has been fully integrated into our operations for more than 15 years, producing a commodity to feed birds of prey, hawks, animals etc., in an animal-welfare friendly manner.

Male chicks are euthanised with CO<sub>2</sub> after hatching and immediately deep-frozen at -30 °C with optimal air circulation, to arrest any internal microbial growth completely. The males should be completely frozen after 24 hours, and they are then stored at -20 °C for a few weeks, before sale and distribution worldwide.

This is a good example of how to make a crisis into a business opportunity: if we had not done this, we would never have gained access to markets such as the United Arab Emirates.

## Clear egg and egg shell processing and recovery

Management of the contents of clear eggs was a problem 8–9 years ago so, in collaboration with technology centres and egg-drying equipment suppliers, we decided to create a prototype to handle this type of waste, which we have finally managed to recover and include in various pig, pet and poultry feed ranges.

Clear eggs are separated by automatic candling at 18 days' incubation, when the eggs are transferred from the incubators to the hatchers. These clear eggs, which are rejected from the hatching process, are separated into shell and contents by a centrifuge, and are automatically channelled through a system of tubes to two separate silos in our egg-drying plant.

The liquid part of the egg is then subjected to a double process:

1. Coagulation: the egg is heated to 80 °C for 20 minutes, to create a semi-solid

g/unit		Units	g	g/DOC	t/100,000 DOC
58.0	HATCHING EGGS SET	100	5800	145	14.5
	PROFITABLE PRODUCTS		2216	55	5.5
38.0	DAY OLD CHICK	40	1520	38	3.8
	WATER		696	17	1.7
	HEAT				
	BY-PRODUCTS		3087	77	7.7
51.0	CLEAR EGGS	10	510	13	1.3
46.0	UNHATCHED EGGS	10	460	12	1.2
6.4	HATCHED EGG SHELL	81	518	13	1.3
39.0	MALES	41	1599	40	4.0

Table 1. Summary of the quantities of waste generated in a hatchery.

texture which can be handled easier in later phases.

2. Drying: the coagulated egg runs through a drier at a temperature of 245 °C for 90 minutes.

Approximately 11 g of dried product is obtained per clear egg as a result of the drying process, reducing the initial volume of waste to a fifth.

The resulting product is an excellent raw material for livestock feed in general, with the following guaranteed nutritional value:

- ➔ Moisture: <12%.
- ➔ Crude fat: >34%.
- ➔ Crude protein: >44%.

Microbiological quality is also optimal, with no Salmonella or Clostridium, and with enterobacteria below 10 CFU.

The shell from clear and hatched eggs can also be placed directly in this same dryer and subjected to a temperature of 45 °C for 15 minutes to reduce its initial weight by 30%.

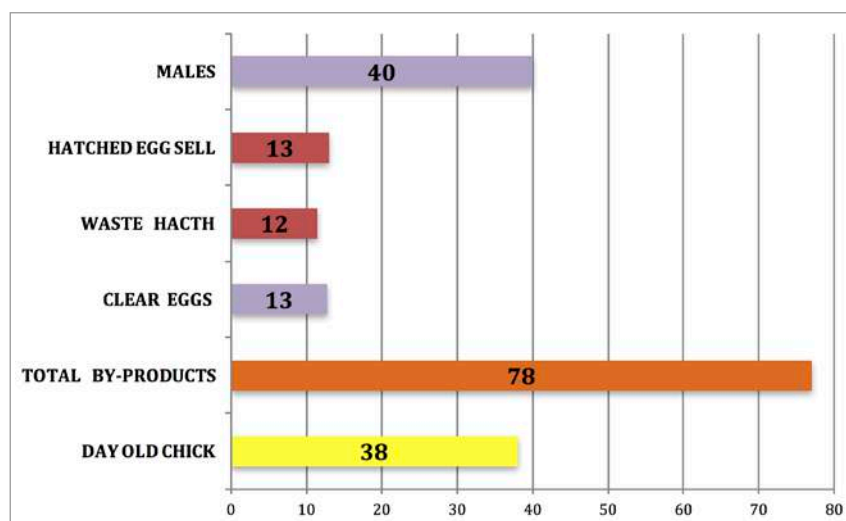


Figure 1. Production of waste per female chick produced (in grams).

### The balance of recovery cost and disposal cost

Waste management is now another cost on the balance sheet for our operation, and we can adopt two strategies to manage it:

- ➔ Accept recycling costs of €240/t for hatching waste (category 2 animal by-products not destined for human consumption according to European legislation) and €108/t for the remaining waste (category 3). Logically, these costs depend on the distance to the disposal plant, the volume of waste produced at each hatch, etc. This waste management costs €1,000/100,000 female chicks, or €0.01/female produced.
- ➔ Recovering waste, avoiding recycling costs and creating other income streams for our balance sheet. We will now analyse the treatment of each kind of waste, from the accounting perspective:
- ➔ Male chicks. We have developed a new sideline to the hatchery business which is complemented by a whole range of products, as well as the male chicks. The financial end result, after costs and depreciation, is a €480



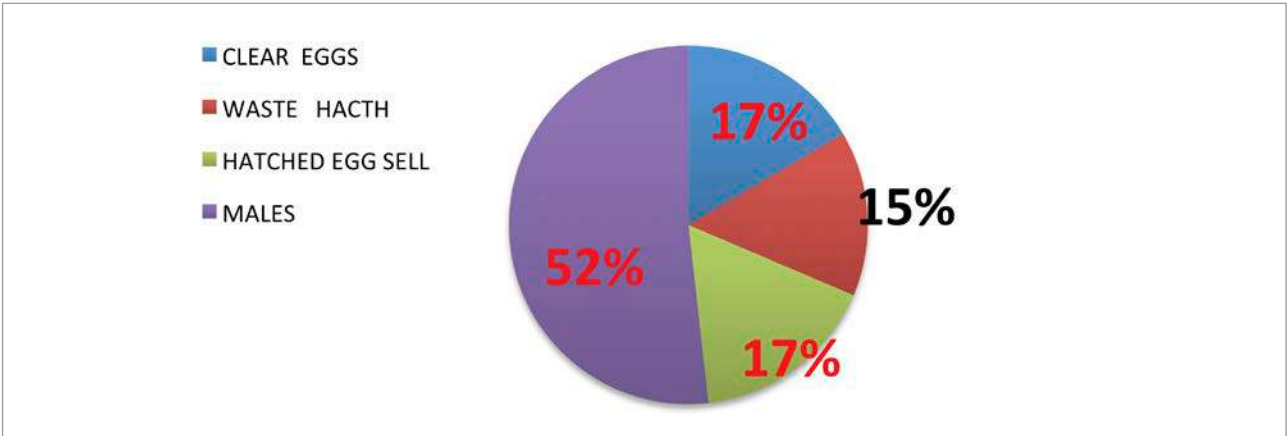


Figure 2. Distribution of waste produced (%)

- margin per 100,000 female chicks produced.
- Clear eggs. Most of these are used in the manufacture of feed for our own parent stock and point-of-lay birds for sale, generating savings of €23–30/t in feed, mostly early stage or high nutrient concentration rations. The financial end result of this operation is neutral, but we avoid the recycling costs.
  - Shells from clear and hatched eggs. We have developed the technology to manage these internally but, given the low value of the final product, it makes more sense to contract the services of an authorised company, at a cost of €140/100,000 female chicks.
  - Unhatched eggs. This is the only waste type that we cannot handle in our facilities, so we have to accept the cost of disposal, at €276/100,000 female chicks.
  - Heat Recovery. At this point in our section on recycling and recovery, we must not forget the outputs generated during hatching. Current technology allows us to recover part of the heat produced during the process, to heat the water for the initial stages of incubation and to make use of the cool temperatures during the

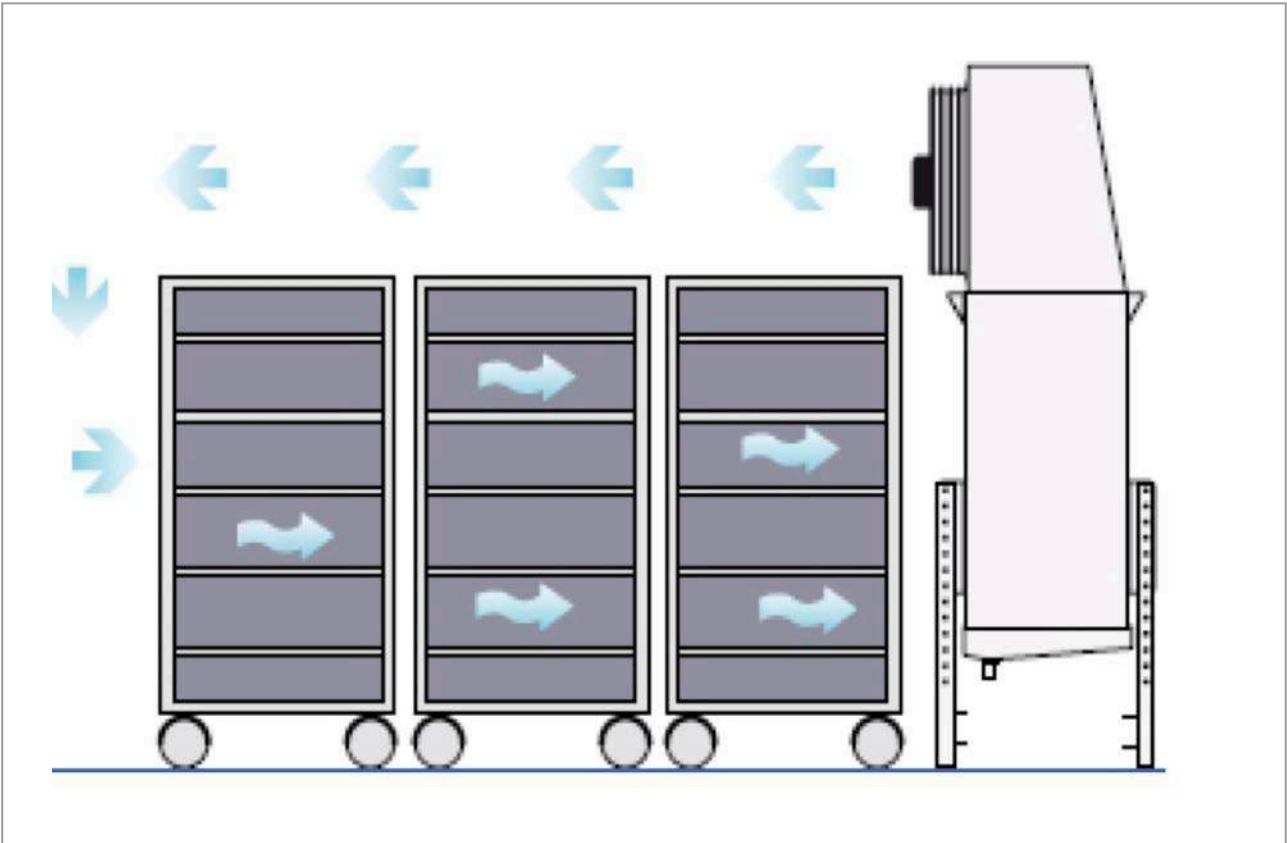


Figure 3. Air circulation inside the deep-freezing tunnel.



Photo 1. Egg-drying equipment.

night to save on consumption by the coolers. This initiative allows us to save 20–25% of our gas and electricity use, which translates into a saving of €364/100,000 female chicks.

Using this second strategy, we handle and recover 84–85% of our waste internally, with a margin of €428/100,000 females, which is a huge competitive advantage over the alternative of recycling through a third party at €0.014/female chick produced.

We must implement these initiatives

in our operations, not only because they significantly reduce the volume of waste (five-fold in some cases) and produce a positive financial balance in our profit and loss account, they also generate qualitative improvements that are sometimes undervalued or overlooked.

- ➔ Staff awareness of the need to comply with the animal welfare policy.
- ➔ Reinforcing and improving our biosecurity programmes.
- ➔ Bringing our agro-industrial operations in line with any other economic acti-

vity, obliging our plant and operations to be clean, respectful and compatible with the environment.

To sum up, the way that problems or crises are managed in situations such as this generates competitive situations and opportunities. These may be of a purely financial nature, or they might improve our animal welfare and biosecurity conditions, and the suitability of our operations for any location.

*Pascual Alonso, Ibertec*

	PRODUCTION( ton)	Euros/ton	COST RECYCLING(€)	PROFIT AFTER RECYCLING(€)
PROFITABLE PRODUCTS				
DAY OLD CHICK	3,8			
WATTER	1,7			
ENERGY				364
BY PRODUCTS	7,7		985	64
CLEAR EGGS	1,3	108	138	0
WASTE HACTH	1,2	240	276	-276
HACHED EGG SHELL	1,3	108	140	-140
MALES	4,0	108	432	480
TOTAL ( 100.000 DOC)			985	428
€/ DOC			0,0099	0,0043
SANDACH 2	SANDACH 3			

Table 2. Comparison of standard recycling costs and internal recovery by Ibertec.



# CUTE EGG: PROVIDING A SAFE SUPPLY OF EGGS TO HATCH THE NEXT GENERATION OF CHICKENS

The results come from a collaborative project between the University of Edinburgh, University of Glasgow, Aviagen Ltd and LOHMANN TIERZUCHT GmbH.

Each year the poultry industry needs to supply huge numbers of chicks that will grow to become egg-laying and meat-producing chickens. This is possible because we can artificially incubate eggs and hatch chicks - because the breeding hens do not need to incubate their eggs, each one can produce many more eggs and chicks. Artificial incubation also reduces the chance that diseases will be transmitted from mother to chick.

The transmission of disease between generations can still occur, especially during the collection and transport of eggs. If eggs are infected with micro-organisms that are harmful to the egg contents this is bad for food safety, and animal and human health, so anything that can reduce this will help maintain biosecurity and reduce the risk further for the consumer.

## The cuticle

The cuticle is a protein layer which covers the surface of the egg and fills the pores in the shell which allow air inside for the growing chick. The cuticle is the egg's first line of defence against bacteria that could come from the mother as the egg is laid and from the environment e.g. from contact with egg collecting belts or handling equipment.

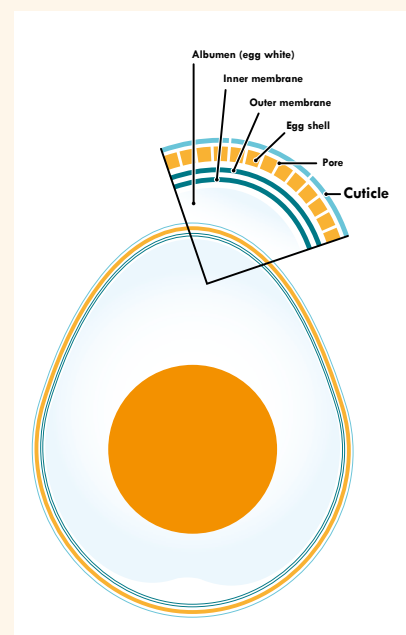
Not all eggs have cuticles of the same quality – natural variation between hens means that some cuticles are better than others. This variation in cuticle quality means that some eggs are more vulnerable to invasion by bacteria and studies have shown that eggs with good quality cuticles are almost never infected with *E. coli* whereas eggs with poor quality cuticles were infected more often. If we can select for better cuticle quality, this will reduce the contamination of eggs by *E. coli* and other potentially harmful micro-organisms.

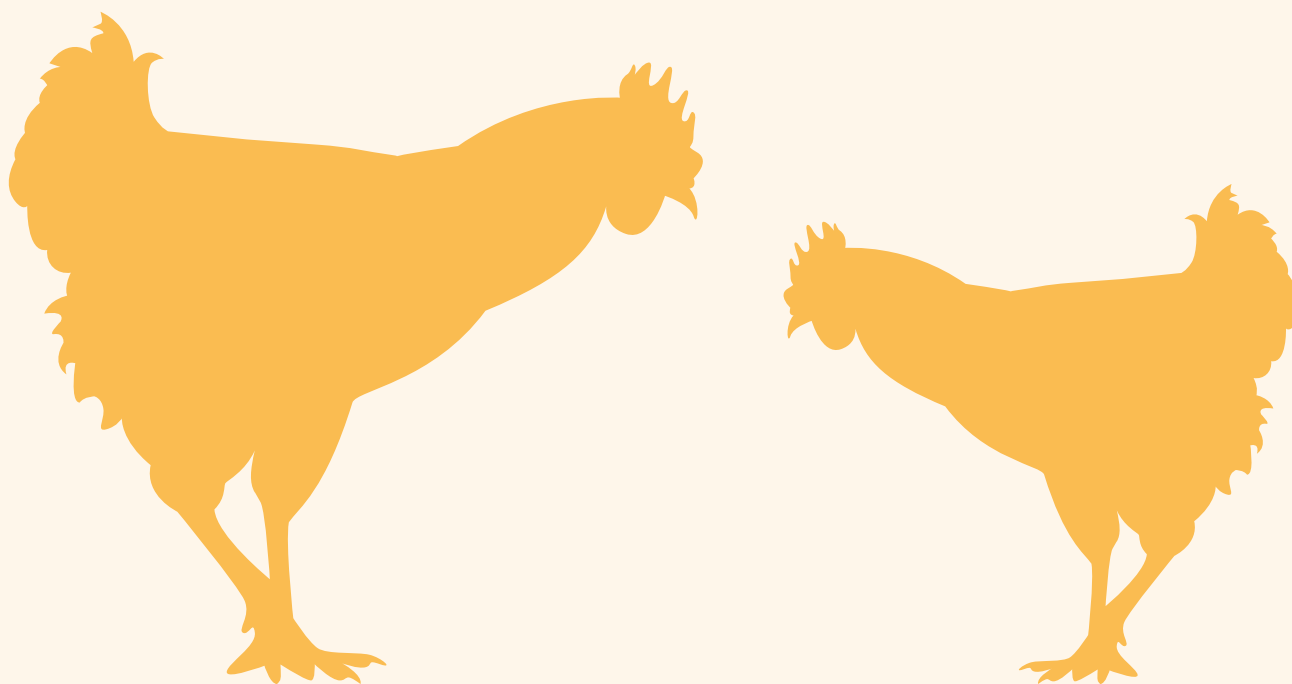
We have developed ways to measure the amount of cuticle individual hens deposit on their eggs and link that to information about the hen's genetics, some of which we obtain by sequencing their DNA. This combination of genetic information and cuticle quality data will allow us to accurately select or breed hens that lay eggs with high quality cuticles that are better protected against bacteria.

We have also learned a lot more about how the cuticle is made, just as the egg is laid, and how other factors such as the bird's environment, stress, hormone levels and the age of the hen and the egg affect cuticle quality.

## How do we measure cuticle quality?

We work with chemists at the University of Edinburgh to develop light-based techniques to measure cuticle quality. White light is made up of a spectrum of many different wavelengths of light and all materials, including the egg's cuticle, absorb and reflect light from different parts of this spectrum. We can use a machine called a spectrophotometer to measure the amount of light reflected at any given wavelength from different eggs and compare them, to get a measure of cuticle quality.





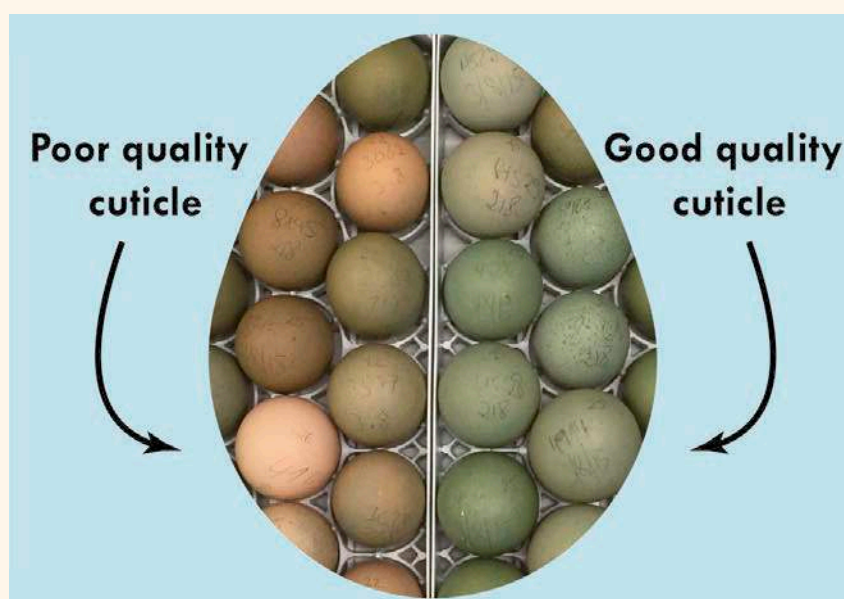
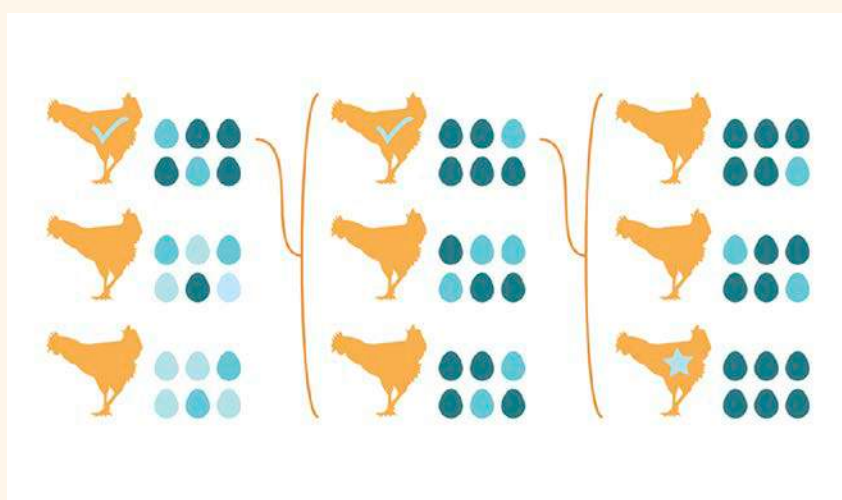
We also use techniques such as fluorescence lifetimes, steady state fluorescence and infrared spectroscopy to tell us more about cuticle quality and the chemical structures involved. Some of our methods involve staining the eggs to reveal more about their cuticle (as in the Cute Egg: Staining activity in our Cute Egg kit), and we are also investigating the many different proteins that make up the cuticle.

### Our other partners

Scientists at the University of Glasgow measure thousands of eggs each week which we can combine with the genetic information we have for each egg and bird in the study. They also study the bacteria in eggs with very good and very poor cuticles to find out how cuticle quality affects invasion by bacteria.

We also work with industrial partners, who provide us with egg samples and genetic information, sharing with us both their sample resources and their knowledge. They help us decide how to design our custom instrumentation so that it is useful for measuring cuticle quality in the real world, and they will field test the final product for us. **For more information visit [www.roslin.ed.ac.uk/CuteEgg](http://www.roslin.ed.ac.uk/CuteEgg)**

*Nicola Stock, Roslin Institute and Royal School of Veterinary Studies, University of Edinburgh*





# Imprint

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