

# **The ISA Breeding Program and Birds Performance “ Breeding for 500 first quality eggs ”**

**Opening ISA Hatchery in Boxmeer  
July 12<sup>th</sup> 2013**

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A Hendrix Genetics Company**



# Outline of the presentation

- Direction of the breeding program of **Institut de Sélection Animale (ISA)** a Hendrix Genetics company.
- Development of new technologies, i.e. **Genomic Selection**.
- Selection for **more first class eggs per hen housed** with the goal to produce **500 eggs** in a longer production cycle.
- **Breed comparison** from the Recurrent Tests.
- **Conclusions**

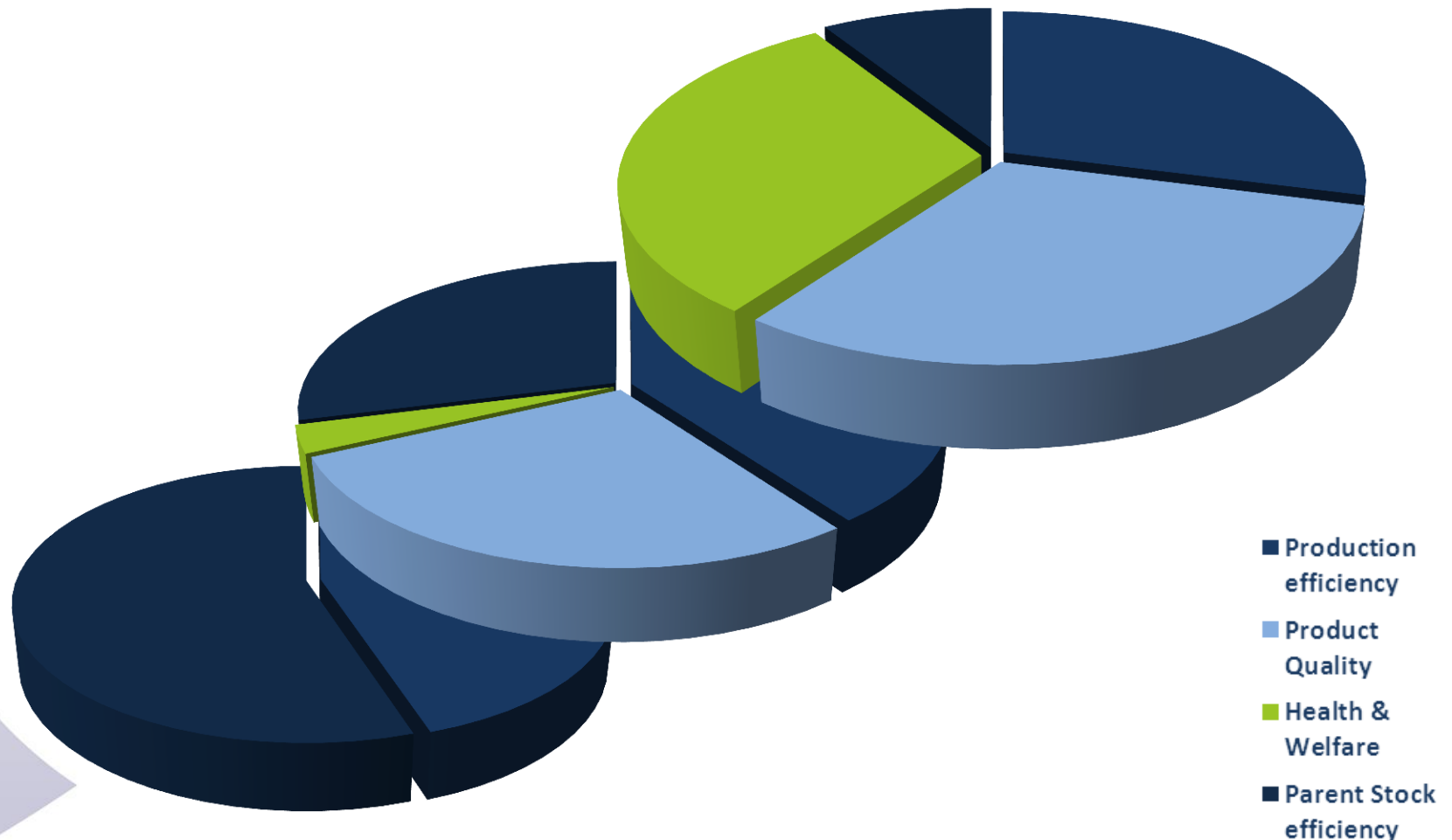


**Changing requirements in housing systems and more focus on animal welfare**



# Balanced Breeding : production and efficiency vs health and welfare

*Historical developments of breeding goals*





# ISA Pure Line Facilities





# Recurrent Tests in different environments:

*EU enriched cages, Canadian stress-tests, North-American densities and a tropical test in Gabon*









# Egg Layer Breeding Excellence

- R&D farms for Pure Lines (individual cages)

- ✓ High bio-security – FAPP, Treated feed
- ✓ many Pure Lines in unique gene pool
- ✓ Testing and selection of new generations PL
- ✓ Back up genetics and Grand Parent production



- Field tests farms (cages)

- ✓ Field based testing of known crosses
- ✓ Family evaluation in Recurrent Test, in a cross
- ✓ Ensuring genetic potential is achievable under field conditions



- Research Projects

- ✓ Robustness and behavior, social interaction
- ✓ Gallus Futurus on floor systems
- ✓ Genomic Selection
- ✓ PN, Marek, Keel bones, E. Coli.

- Product Field performance analysis

- ✓ From data collected by distributors and ISA technicians





# Highlights Breeding Program - selection traits



Liveability  
Behaviour  
Adaptability  
Feathercover



- Egg Quality
  - Internal
  - External
  - Color
  - Dry Matter Content
  - TMA
- Egg Numbers
  - Early maturity
  - Peak production
  - Laying percistency



- Feed Conversion
  - Feed Intake
  - Body Weight
- Egg Weight curve
  - Hatchability
  - Chick quality



# New traits/breeds: Gallus Futurus

- Breed better for non cage
- INRA (F), WUR (NL), ISA team
- Also feed and temperature stress

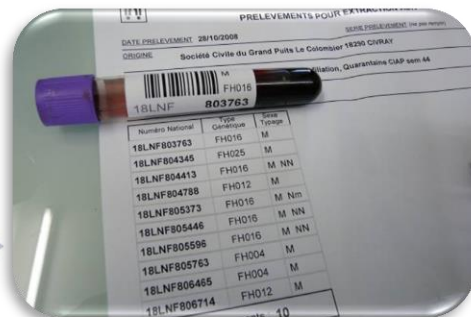
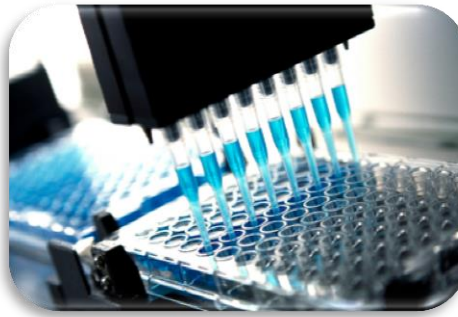




# Genomic selection in important lines, 60,000 gene markers



- More genetic progress
- Faster genetic improvement
- Focus on promising traits



G-BLUP

# Recent new tool developments -Genomic Selection

- Through DNA research with the HG-60.000 SNP chip, breeding values are estimated more accurately; even at a younger age. Resulting in **more progress**.
- Testing full sib males to make a difference. Resulting in **increased selection intensity**.
- Therefore with genomic selection the generation interval (which tends to increase by the longer laying cycles) can be reduced. Meaning **faster progress**.
- Making use of advanced mating-schemes, incorporating all genomic information, results in decreased inbreeding levels and less pedigree errors. Creating **sustainable progress**.



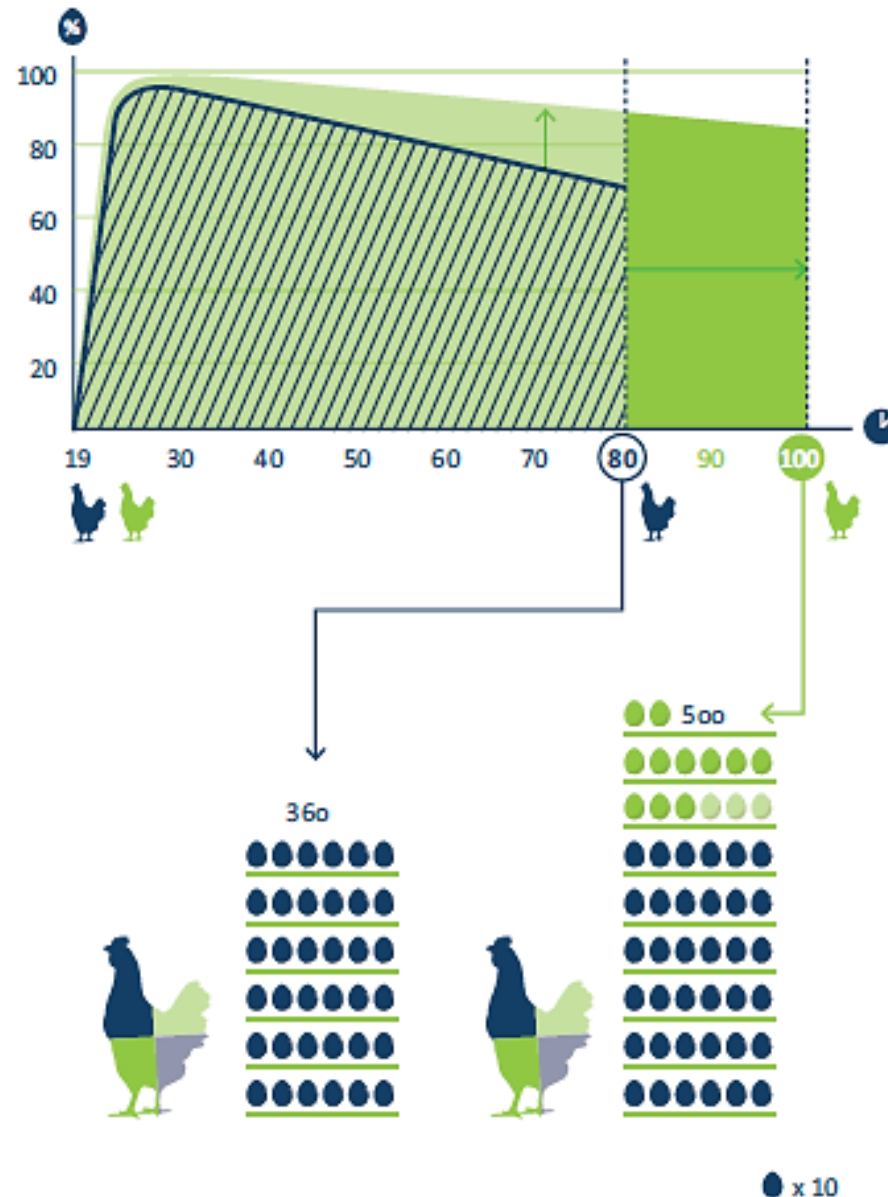


# ISA Breeding Program

**500 eggs in 2020  
dream or reality ?**

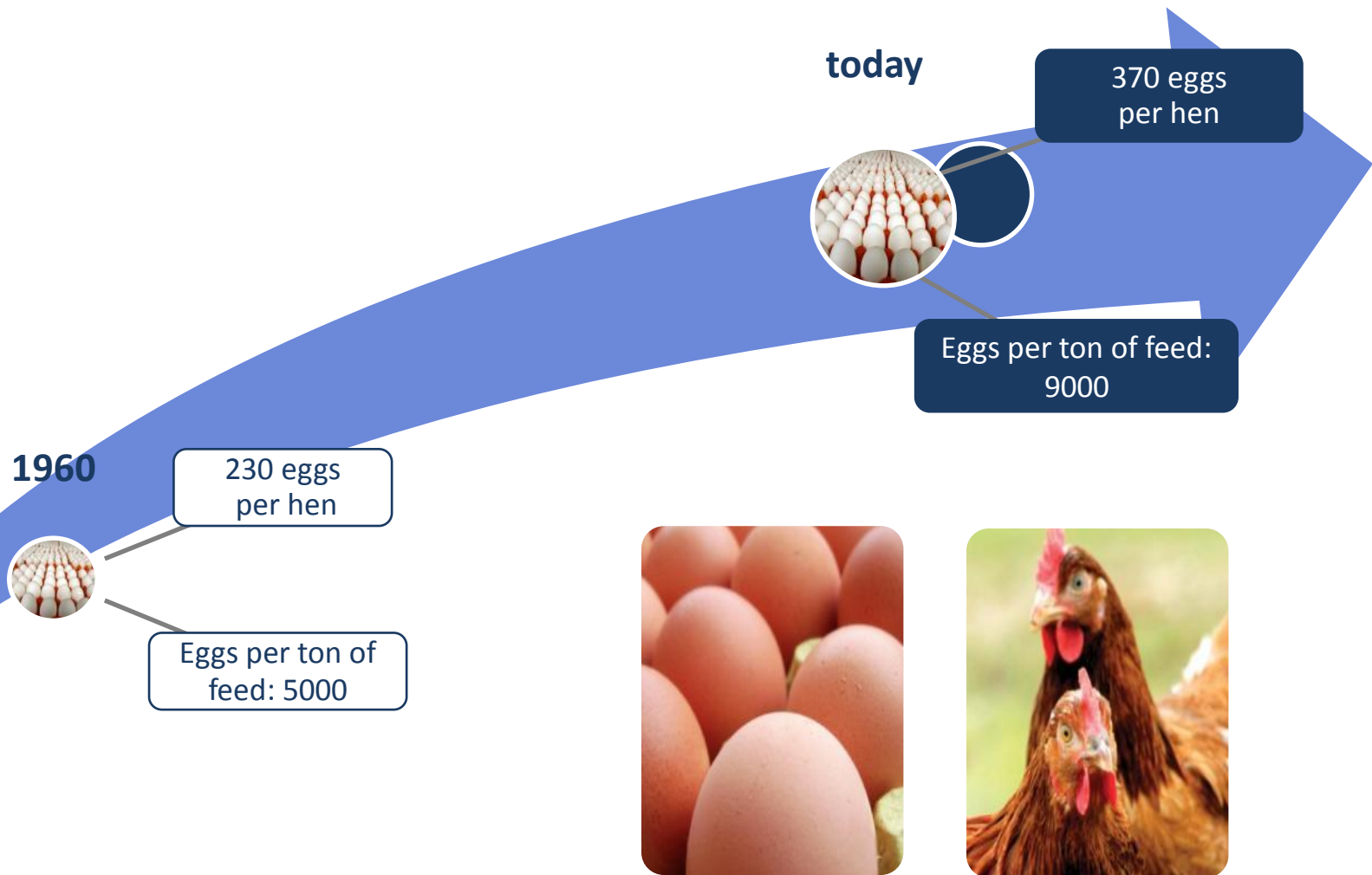


# Laying persistency and longer cycles





# Genetic Progress in Layers



# Development of the modern Brown commercial layer

		1970	2000	2008	2013	2020
HH EGGS AT 75 Weeks	(NRS)	239	306	324	336	361
HH EGGS AT 90 Weeks	(NRS)				409	440
HH EGGS AT 100 Weeks	(NRS)					500
AGE AT 50% PRODUCTION	(WKS)	26	20	20	20	20
AGE AT PEAK PRODUCTION	(WKS)	29	26	26	25	25
RATE OF LAY AT PEAK	(%)	86	95	96	96	97
EGG MASS AT 75 Weeks	(KG)	14.9	20.0	20.8	21.0	22.6
EGG MASS AT 90 Weeks	(KG)				25.7	27.7
EGG MASS AT 100 Weeks	(KG)					31.4
FEED/DAY	(G/D)	127	114	114	113	112
FCR resp. 75 to 90 to 100 weeks of age	(KG/K)	3.46	2.31	2.23	2.18	2.07
LIVEABILITY	(%)	90	94	94	94	95
HEN DAY RATE OF LAY AT 75 Weeks	(%)	55	74	76	77	82
BODYWEIGHT AT 18 Weeks	(KGS)	1.72	1.55	1.55	1.50	1.50
ADULT BODYWEIGHT	(KGS)	2.5	2.0	2.0	2.0	1.9

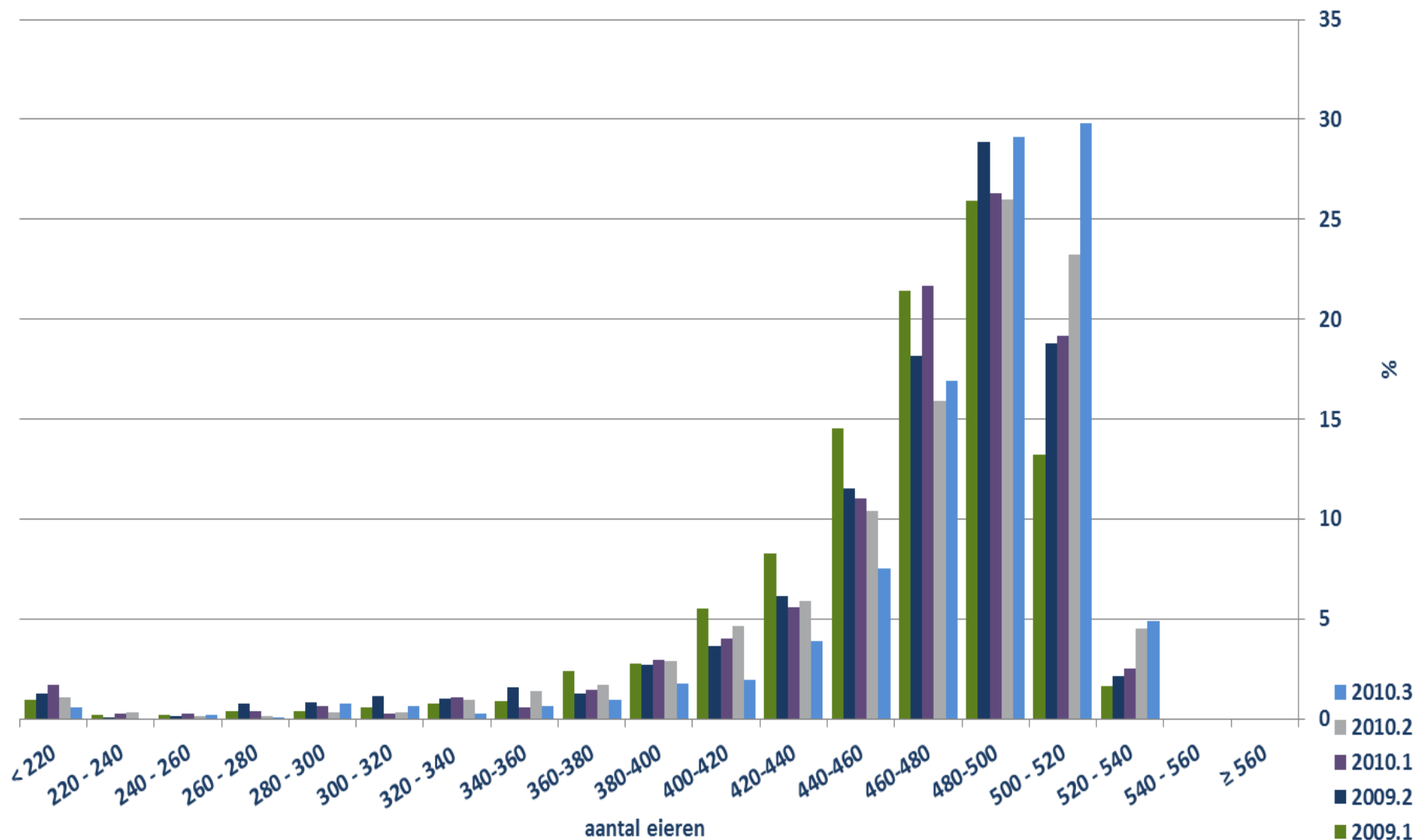


## Development of the modern White commercial layer

		1970	2004	2009	2013	2020
HH EGGS AT 75 Weeks	(NRS)	250	315	329	339	364
HH EGGS AT 90 Weeks	(NRS)				413	444
HH EGGS AT 100 Weeks	(NRS)					505
AGE AT 50% PRODUCTION	(WKS)	24	20	20	20	20
AGE AT PEAK PRODUCTION	(WKS)	27	26	25	25	25
RATE OF LAY AT PEAK	(%)	88	95	96	96	97
EGG MASS AT 75 Weeks	(KG)	15,4	20,5	20,7	21,1	22,7
EGG MASS AT 90 Weeks	(KG)				26,1	28,0
EGG MASS AT 100 Weeks	(KG)					32,0
FEED/DAY	(G/D)	115	110	110	109	109
FCR resp. 75 to 90 to 100 weeks of age	(KG/K)	3,03	2,18	2,16	2,10	1,98
LIVEABILITY	(%)	90	94	94	94	95
HEN DAY RATE OF LAY AT 75 Weeks	(%)	60	75	76	79	84
BODYWEIGHT AT 18 Weeks	(KGS)	1,4	1,3	1,3	1,3	1,3
ADULT BODYWEIGHT	(KGS)	1,8	1,7	1,7	1,7	1,7

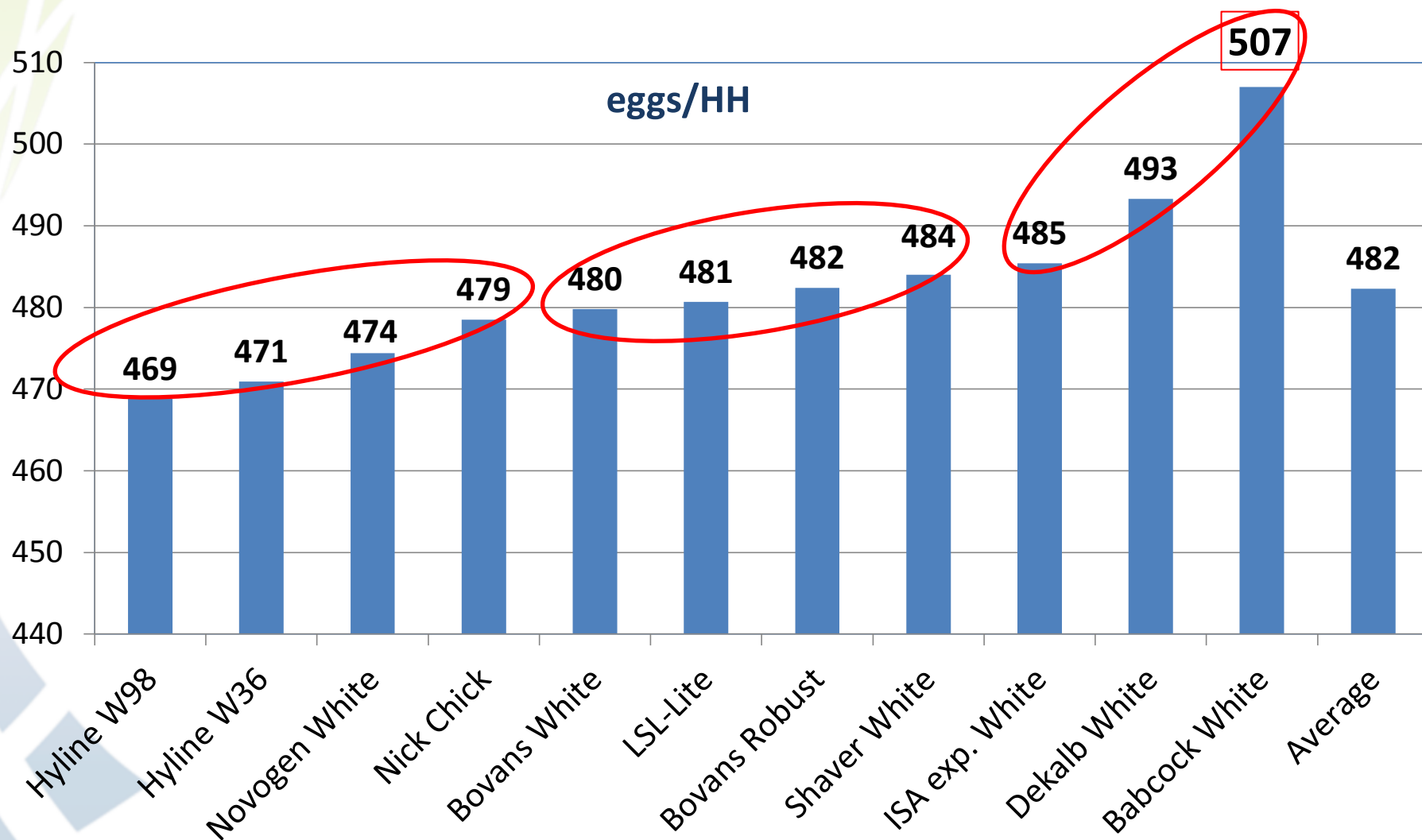
# Frequency distribution egg numbers in a pure line over time

WA| 2009.1 | 2009.2 | 2010.1 | 2010.2 | 2010.3





# HH egg number in 38<sup>th</sup> NC USA RST; till 109 wks





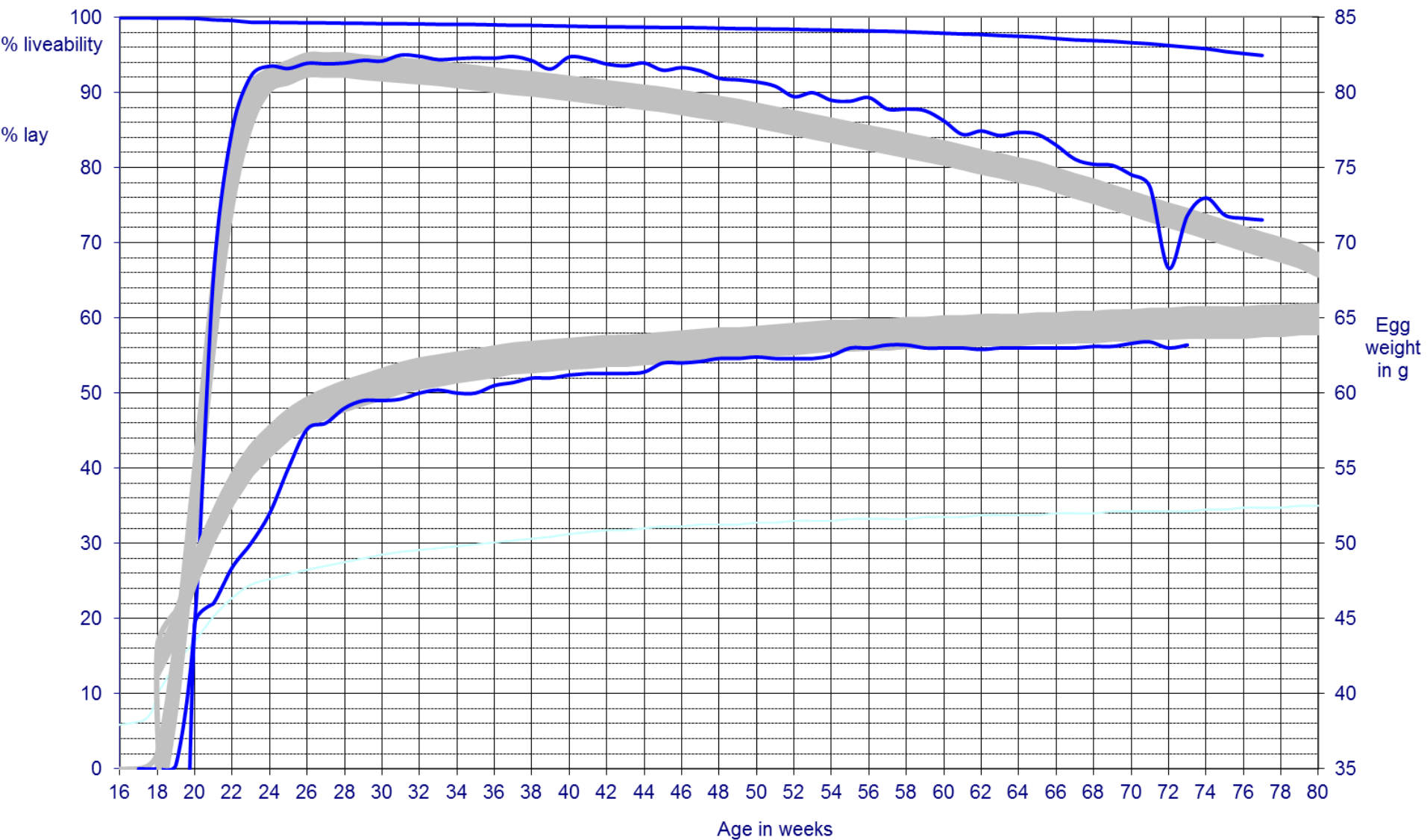
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Name  
House number / system  
Hatch date  
Transfer date  
Number of birds housed

/ Organic
June 29, 2011
11,939



### PRODUCTION GRAPH ISA BROWN COMMERCIAL LAYERS-1



# Bovans Brown CS in Barn



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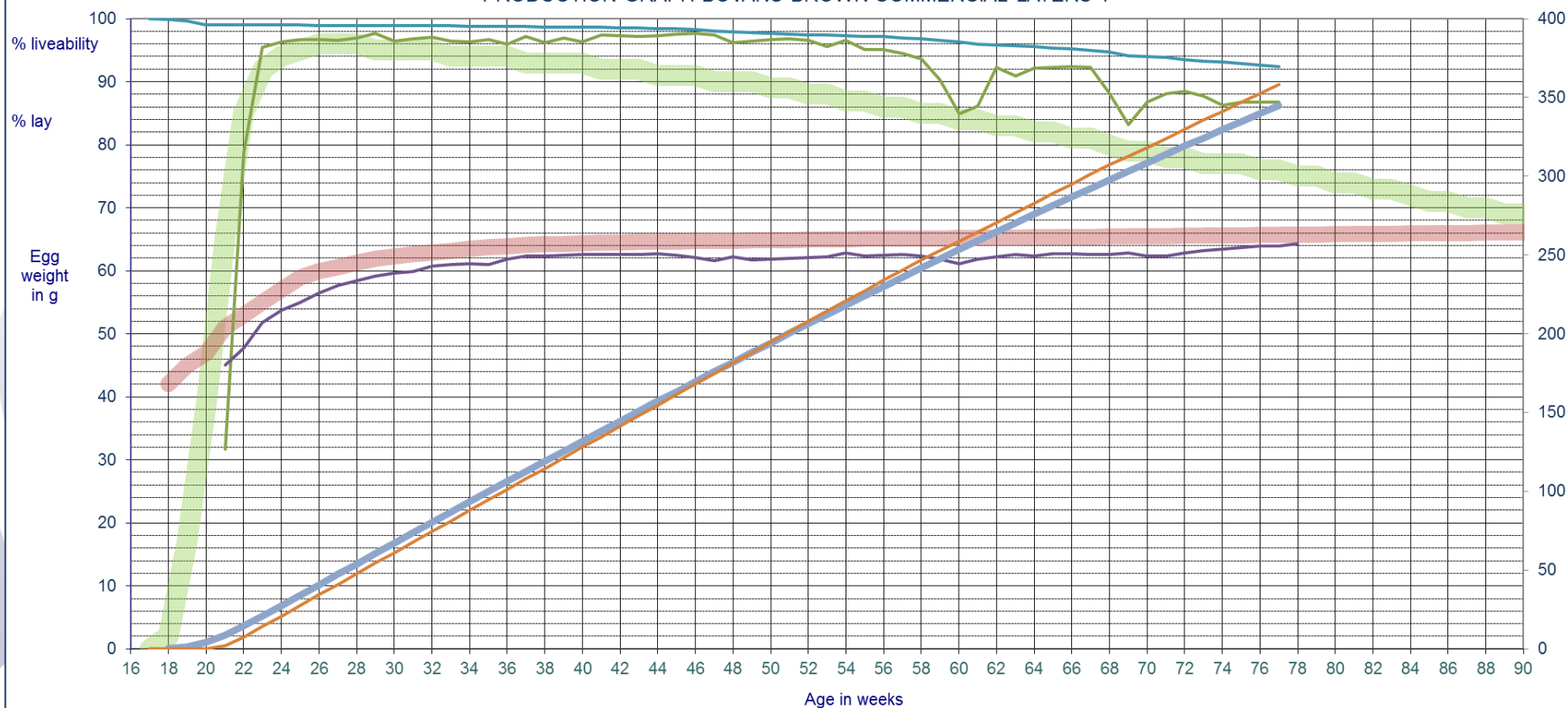
Name  
House number / system  
Hatch date  
Transfer date  
Number of birds housed

House nr.	Hok2	br system
Hatch date	May 13, 2011	
Transfer date	September 9, 2011	
Number of birds housed	15.000	



HH  
EGGS

PRODUCTION GRAPH BOVANS BROWN COMMERCIAL LAYERS-1





# Dekalb White CS in Aviary

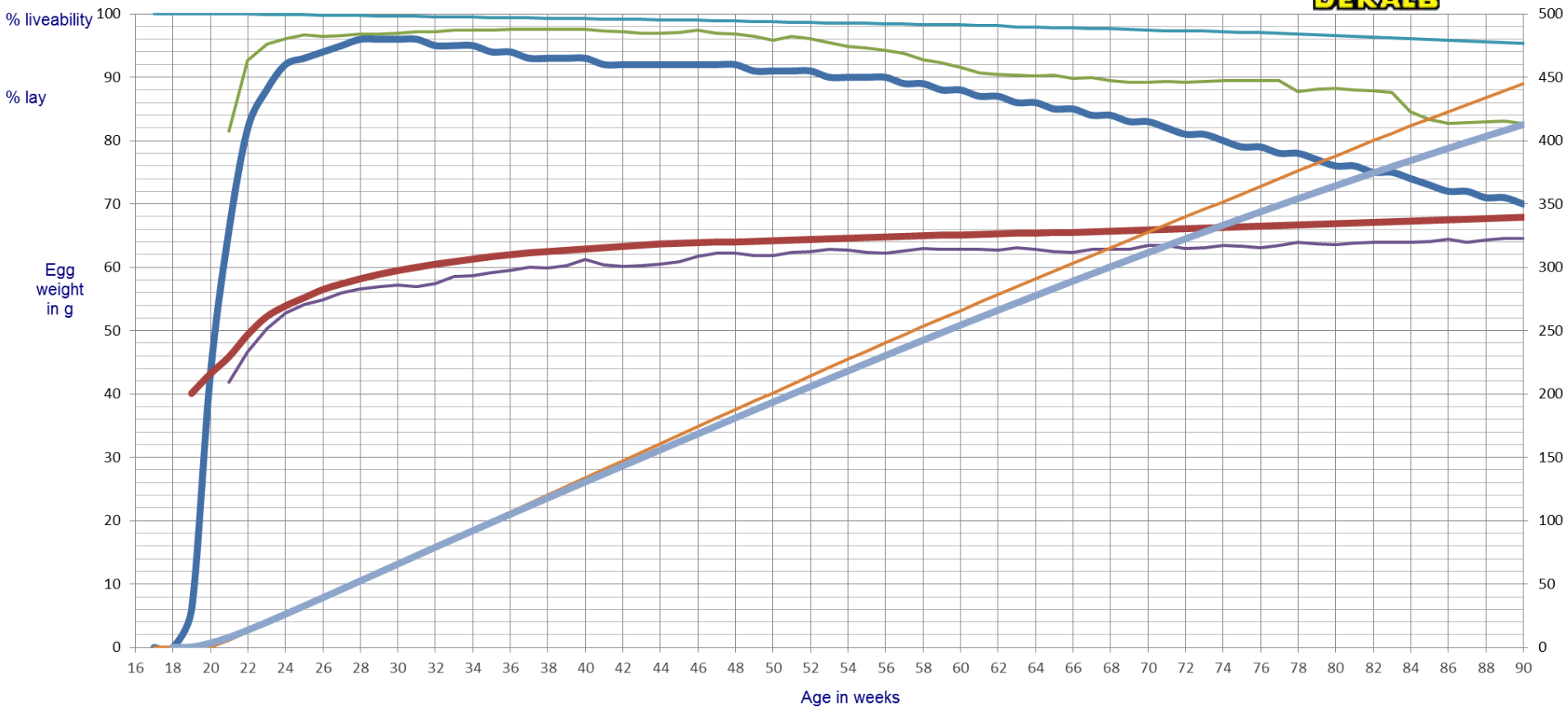


Name  
House number / system  
Hatch date  
Transfer date  
Number of birds housed

UNKNOWN DKW FLOCK	
House nr.	1 vo system
December 17, 2010	
May 6, 2011	
20.000	



## PRODUCTION GRAPH COMMERCIAL LAYERS-1



# Conclusions ISA Breeding Program

## Breeding objectives

- Increase earnings for egg value chain with excellent ISA products
- Improve the welfare of animals

## Breeding strategy

- Continuous increase of 1st quality eggs per hen housed
- Invest in genomic selection and other technologies
- Go for 500 eggs in prolonged cycles with excellent Feed Conversion

## Breeding resources

- Pure line breeding in excellent facilities
- Recurrent testing: evaluating crossbreds in the field
- Hendrix Genetics Research and Technology Centre
- Excellent team of dedicated people

# The best genetics from the most state of the art and highest bio-security standards hatchery





**Breeding for 500 first  
quality Eggs!**

**Thank you for the  
attention.**

