Past progress in layer genetics. Predicted advances and challenges.

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Change in the World of Layer Genetics

- 2005: Hendrix Genetics is established
- 2006: Merging Institut de Selection Animale(ISA) and Hendrix Poultry Breeders(HPB)into Hendrix Genetics
- 2007: Euribrid Acquisition:
  (Hybro Broilers,Hybrid Turkeys, Hypor pigs)
  Name and logo for layer activities:

2008: Hendrix Genetics forms link with Cobb Vantress in Research and Development (Genetics)

HENDRIX GENETICS, Headquarters in Boxmeer



Villa “De Körver” Boxmeer, The Netherlands

Facilities: Pure Line

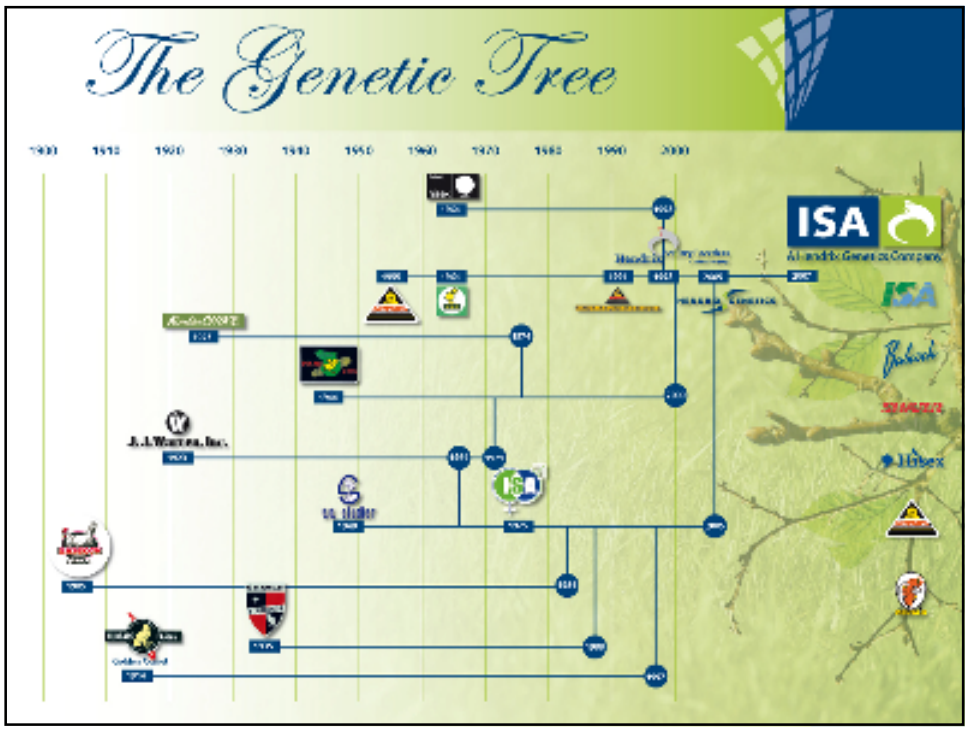


Outline of this talk

- The development of performance of layers
- Current breeding program and new developments
- Main future breeding strategy
- Conclusions

Main Products of Institut de Sélection Animale





A company with a rich Human History



Guust van den Eijnden
1922 – 1983
HISEX



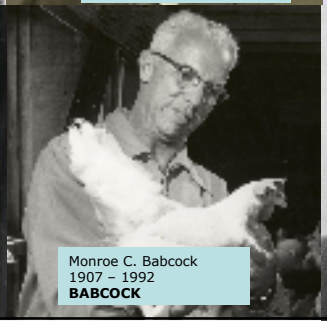
Donald McQueen Shaver
90 years old in August 2010
SHAVER



Harrie van Duijnhoven
1912 – 2001
BOVANS



James J. Warren
WARREN



Monroe C. Babcock
1907 – 1992
BABCOCK



Wim Hendrix (Wimke de Körver)
1896 – 1965
Founder of Hendrix Feeds



Our Distributors in New Zealand and Australia



SHAVER with BROMLEY PARK in NEW ZEALAND SINCE 1972

ISA BROWN with BAIADA in AUSTRALIA since 1992

HISEX Brown with INGHAM in Australia Since 1991

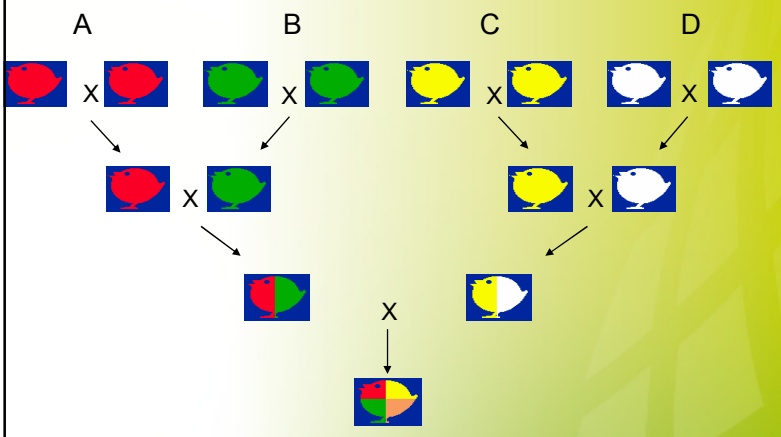
Performance of Shaver Brown in 2010 at 80 weeks of age

	Shaver Brown In New Zealand	Shaver Brown Performance Standard
Liveability	95 – 96.5	94.2
Age at 50% Production	133-140	145
Peak %	95 - 97	95
Egg numbers per hen housed	375 - 385	349
Av. Egg weight	61- 63	63
Av. feed consumption	106 - 109	110
Kg feed/doz eggs	1.50 – 1.55	1.68

Shaver Brown performance in New Zealand, expressed in egg numbers and feed conversion, is consistently around 10% ahead of our World Standard

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Hybridization Program:



Pure Lines

Grandparent

Parent Stock

Commercial Layers

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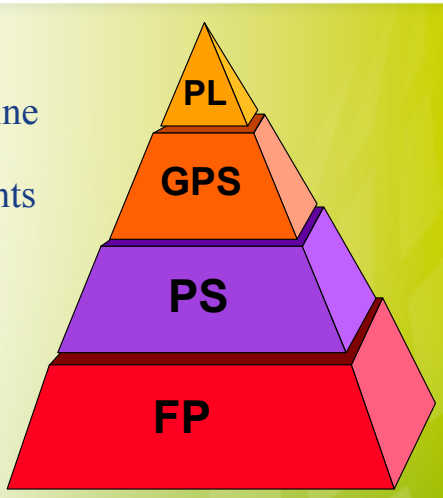
Multiplication factors:

1 Pure Line

80 Grand Parents

6,400 Parents

550,000 Laying hens



One Pure Line bird produces progeny that finally lay 180 million eggs. We have to be very careful and very scientific with our selections!

Development of layers over the last 20 years:

- The commercial layer has gained about ***70 eggs***:
  - with genetic improvement (+2.3 eggs / year)
  - with extension of the cycle (68 →75+ weeks)
- Age at peak has decreased
- Peak rate of lay has increased
- Adult bodyweight has decreased
- Liveability has improved
- Feed intake and feed per dozen eggs have reduced

Of course besides genetics: management, feed and disease prevention have played an important role in this improvement

Trends in the layer business (1)



- In several areas, now, mainly EU and USA, producers have to change to alternative systems.
- Legal pressure for a ban on bird treatments like beak trimming, de-combing and de-toeing.
- Pressure for reduction of antibiotic use.
- Animal welfare pressure on bird management, for example moulting and euthanizing male DOC in hatcheries.
- More influence of consumer demand concerning animal welfare and egg quality (egg size, shell colour and Haugh Units)

Trends in the layer business (2)

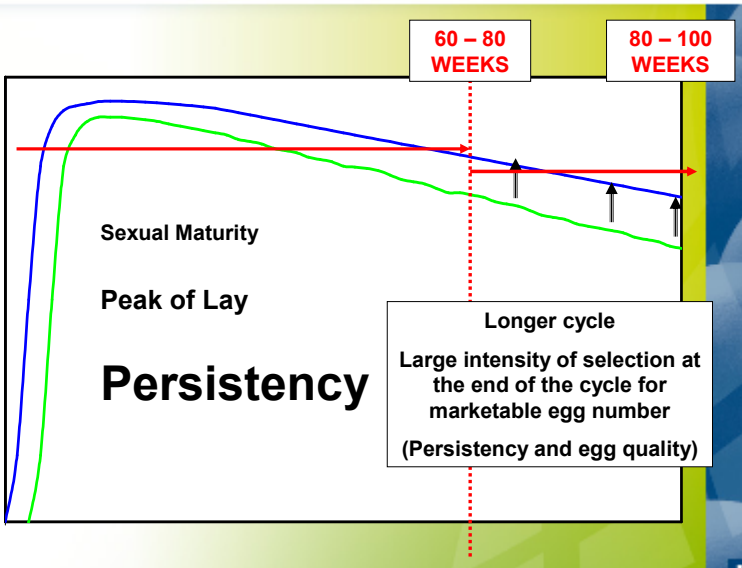


- Segmentation in some markets (USA) for egg processing and table eggs. Importance of solids.
- More by-products as feed ingredients, eg. Dried Distillers Grains and canola from the biofuel industry.
- Call for efficient use of resources: feed, water, energy and land. Carbon footprint.
- Longer cycles for parent stock and commercial birds.

The goal

- The ISA breeding company has to respond to these trends in the layer business.
- The breeding program has to develop the best birds, for the current and new environments and the different market needs. This is done through:
- - selection
- - new combinations
- - research projects with institutes and universities

Selection on persistency & egg quality to 100 weeks of age
Example: SHAVER Brown



Traits under selection



- Liveability
- Behaviour
- Adaptability
- Feather cover
- Egg Quality
  - Internal
  - Shell Quality
  - Colour
  - TMA
- Egg Numbers
  - Early maturity
  - Peak production
  - Laying persistency
- Feed Conversion
  - Feed intake
  - Body weight
- Egg weight curve
  - Hatchability
  - Chick quality

Extra concentration on parameters in red

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Selection Environment



We have to test and select our birds under different environments:

- Pure Line
  - Housed in Single Cages
  - Constant Climate
  - Constant Feed Quality
  - No Diseases
- Recurrent Test
  - 5 Birds per Cage
  - Different Climates (Moderate, Tropical)
  - Different Feeds
  - Disease Pressure

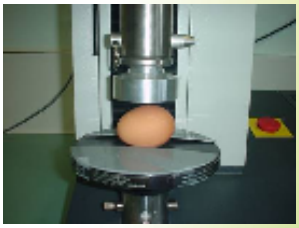
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Intensive selection of EGG QUALITY traits









Good egg quality is very important, so for several years now we have been investing much more on selecting birds for improved internal quality and shell quality

New genomic breeding techniques allow us to examine 60,000 gene markers in every bird



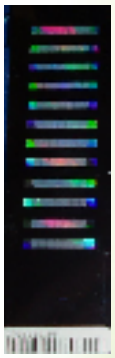


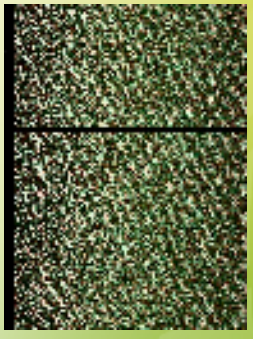
More genetic progress

Faster genetic progress

More focus for difficult traits

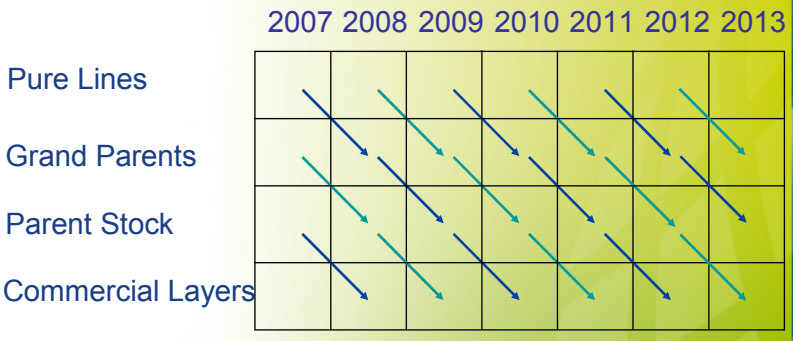






Reproduction Timetable:

Commercial performance in the field in 2010
is based on our Pure Lines from 2007:



Based on known results at Pure Line level between 2008 and now, we know for certain that, each year from now, you will see higher performance at the commercial level in New Zealand

Development of layers over the next 10 years:



Expected trends:

- An extra 25 eggs per bird
- 1% higher peak at same age
- Egg weight/size will increase in early lay
- Egg weight will decrease in late lay
- Feed intake will be similar
- Feed per dozen eggs will continue to reduce
- Birds will be capable of being kept to 90+ weeks of age

BUT, if we are to take full advantage of the improving genetics: nutrition, housing and management will also need to keep pace

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Conclusions



SHAVER

Hisex

ISA

Babcock

BOVANS

- **Strong improvement of layer performance over the last 20 years**
- **State of the art ISA R&D program**
- **Development of new technologies, e.g. genomic selection**
- **Genetic progress will continue and is our future**
- **Layers will be kept longer. Breeding program is adapted**
- **Main selection focus on laying persistency, egg quality and liveability**
- **Depending on weeks in lay, layers will produce 450 500 eggs per bird by 2020**

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