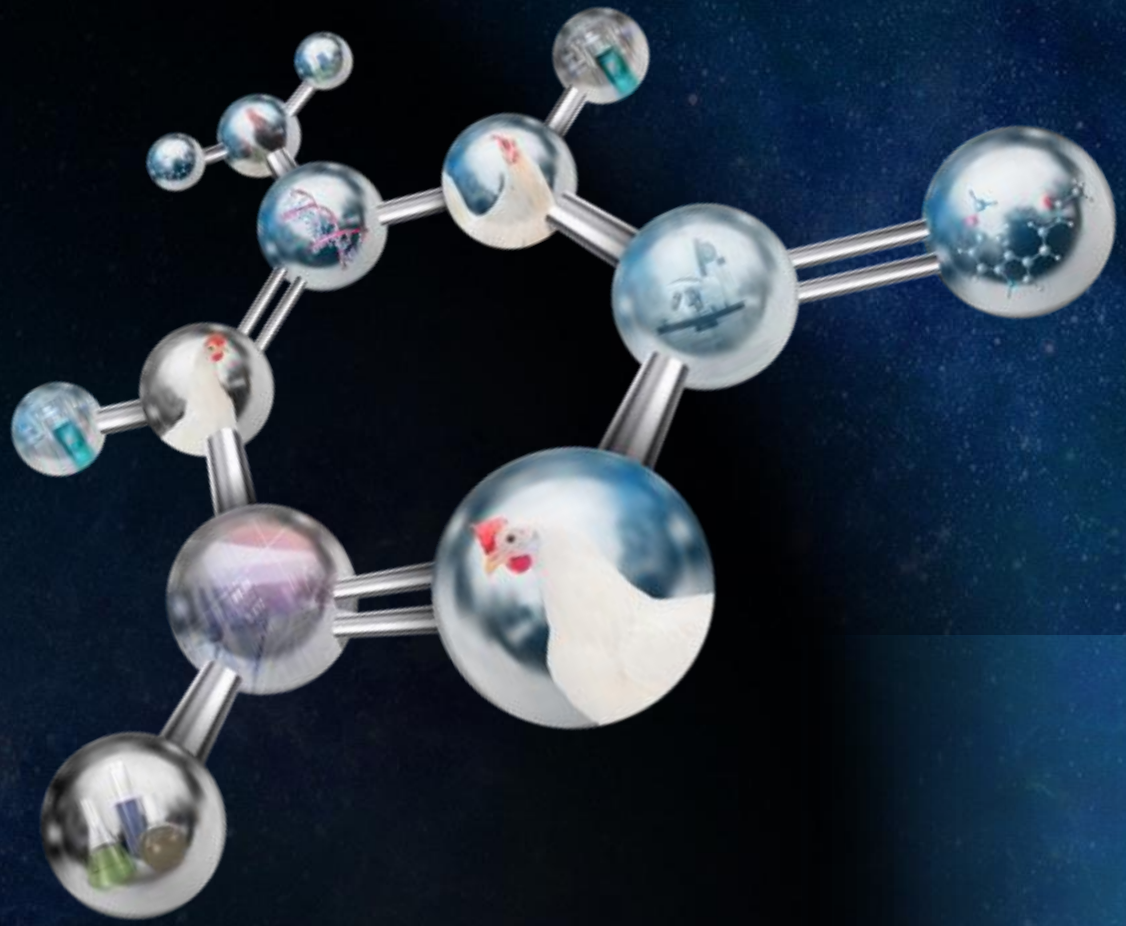


Future of the layers

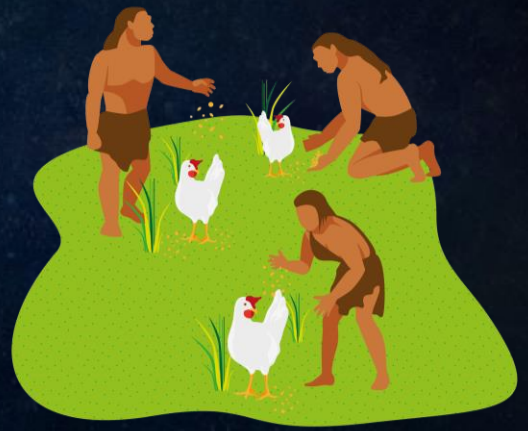
Dr. David Cavero Pintado

H&N Cage-Free Academy – Cuxhaven 1 April 2025

Evolution of the laying breeding sector

Continuous Progress

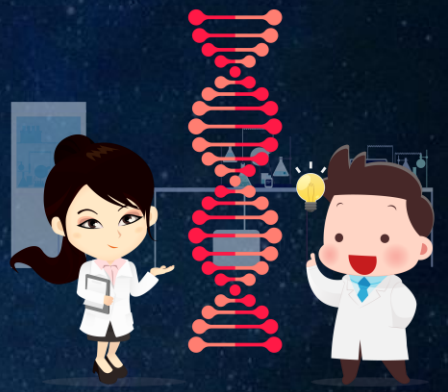
Past



1930

1980

2010



2020

Pure lines – Breeding farms

Data Recording

Breeding Farms

Single Cages	Group Cages	Cage-Free
		

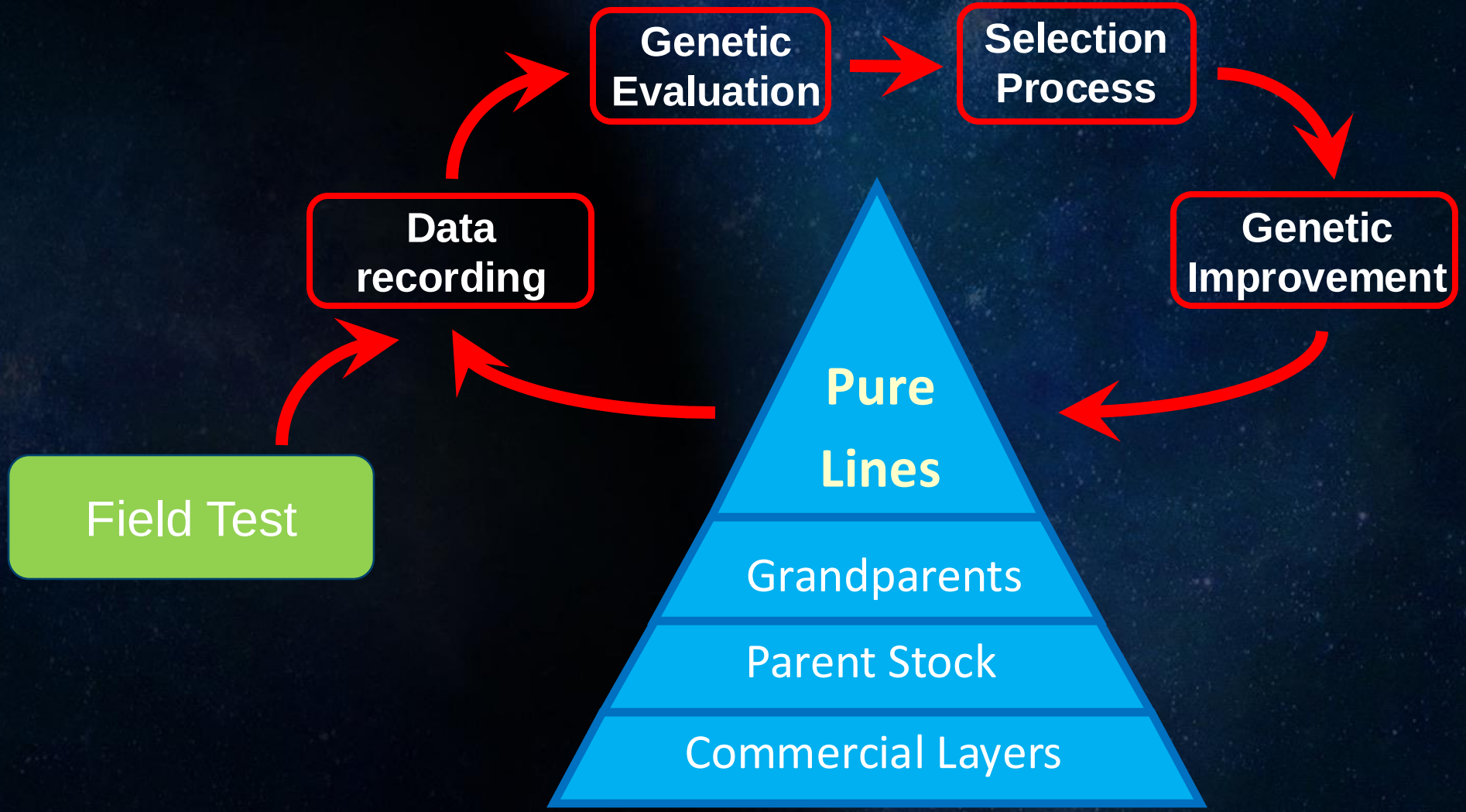
Data Recording

Field Testing – Commercial Farms

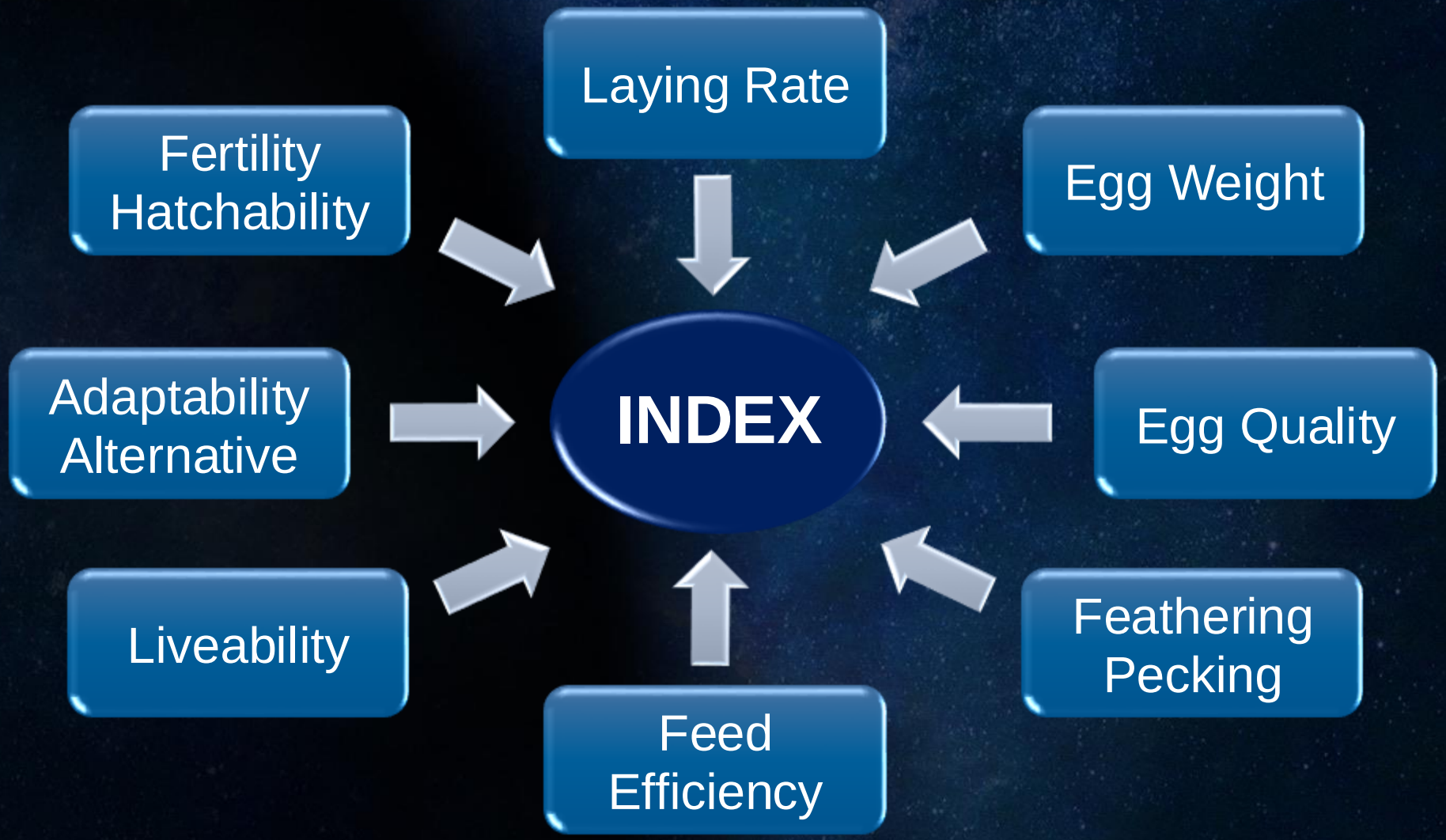
Group Cages

Free Range

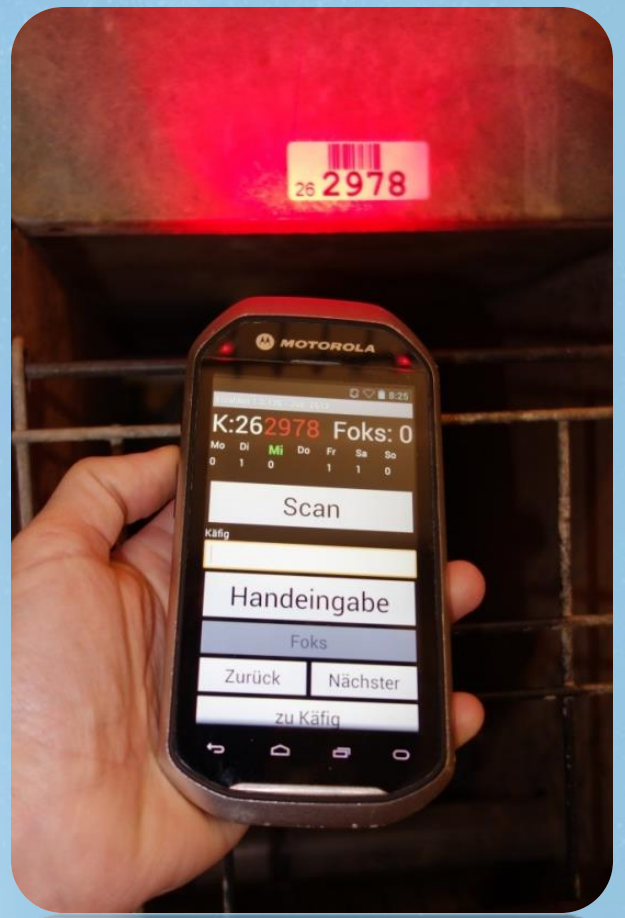
Structure of the Laying Breeding



Balanced Selection

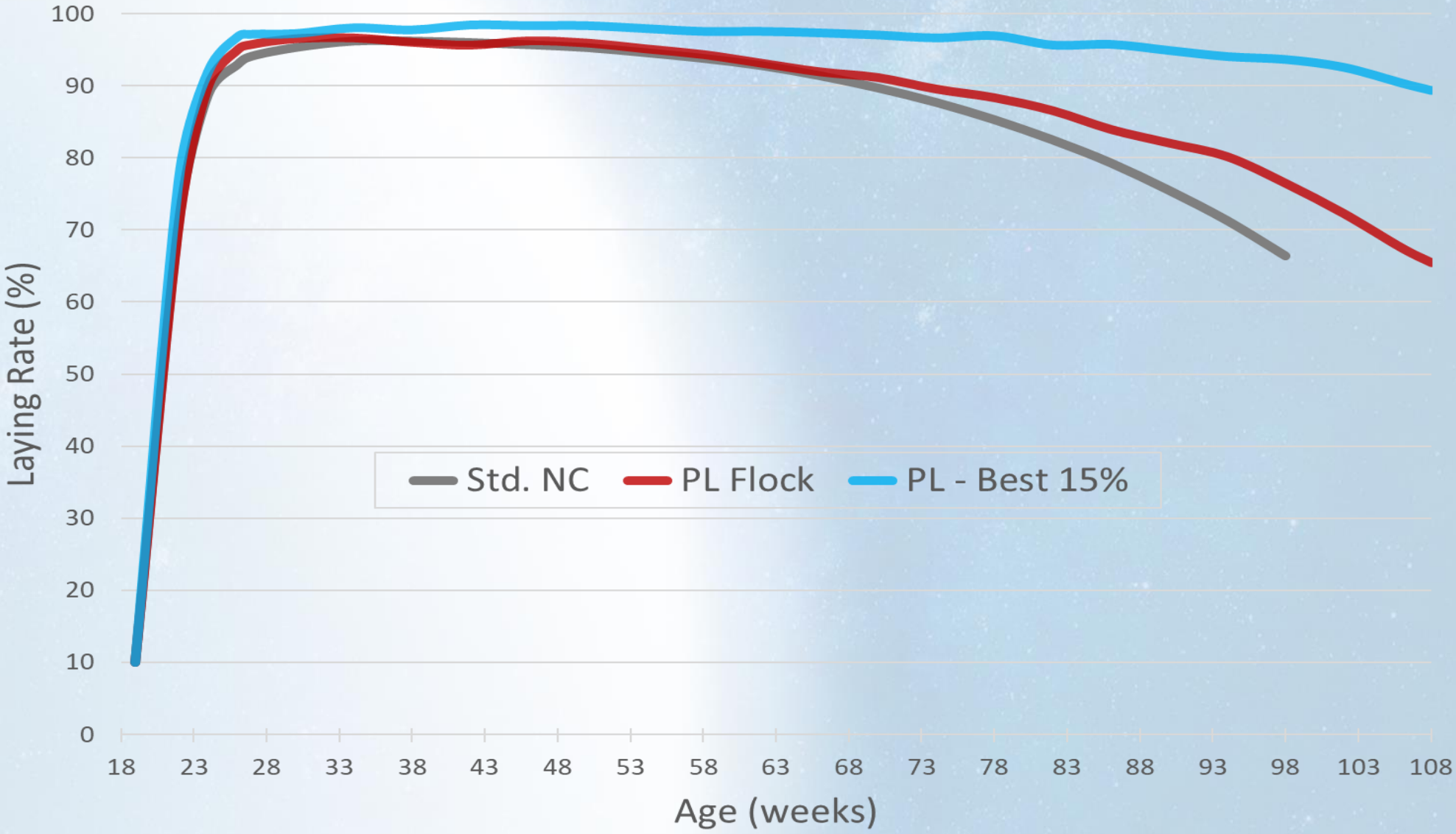


Daily egg number

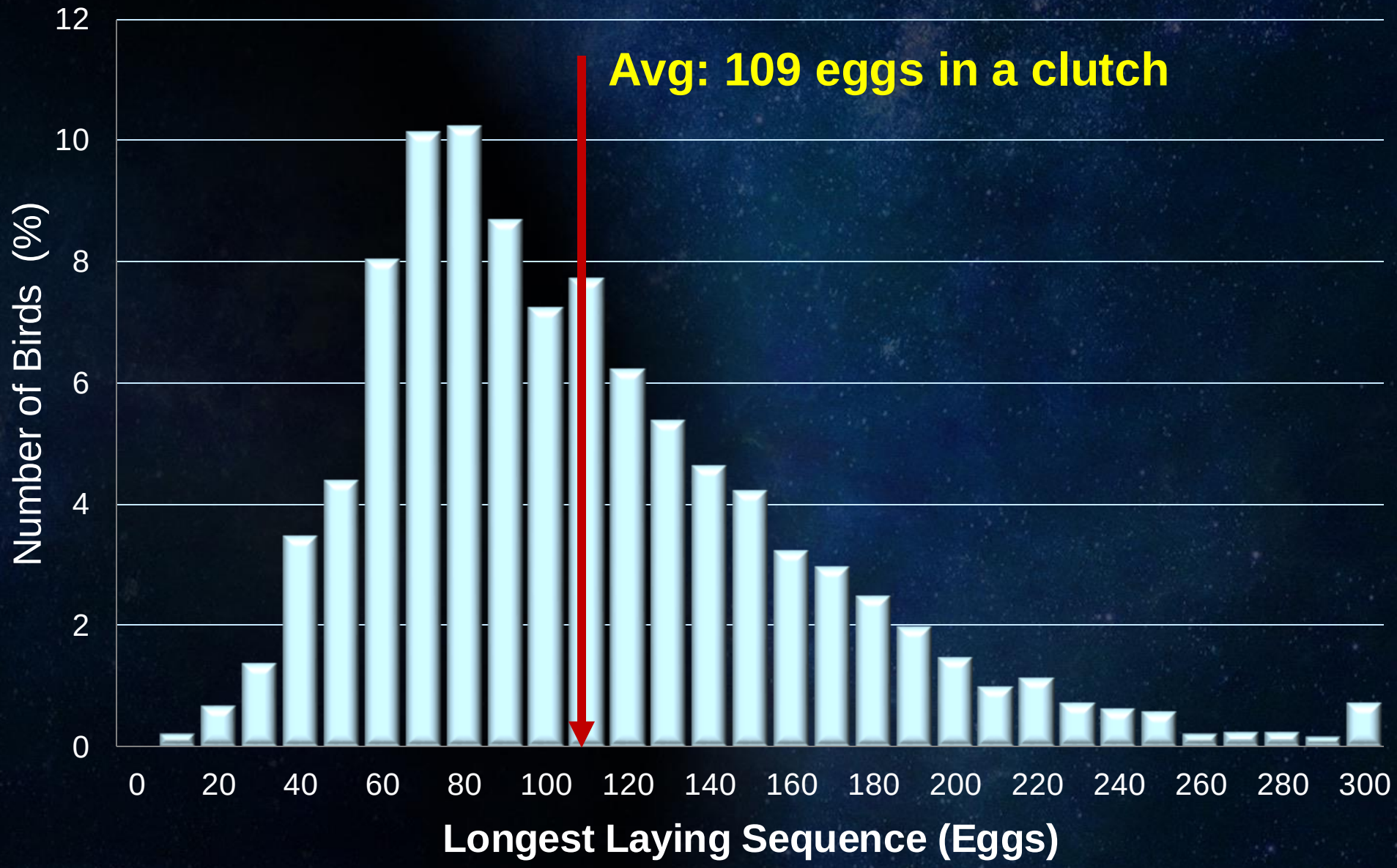


Only saleable eggs!

Laying Performance - Persistency

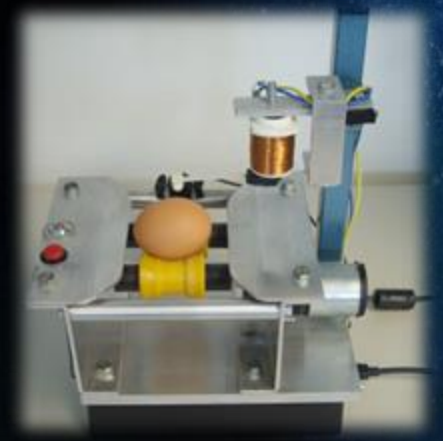


Clutch length



Eggshell Strength

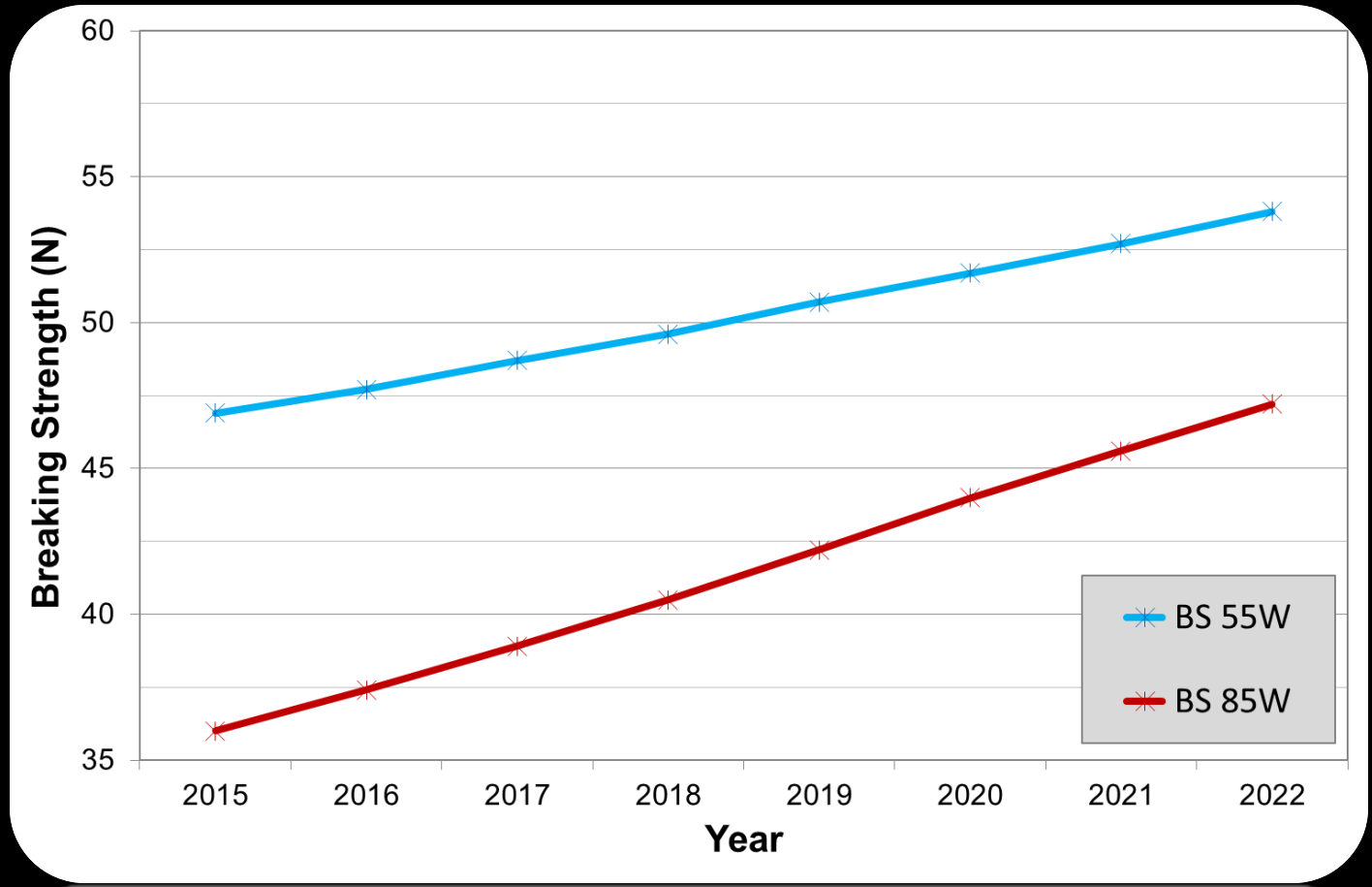
Eggs breaks at the right time!



Selecting for a better eggshell:

- ✓ Reduce waste
- ✓ Decrease contamination risk
- ✓ Extend flock production life

Breaking Strength



H&N INTERNATIONAL

Egg Weight

Influencing Factors:

- Light stimulation, Body Weight, Feed
- Genetic – h^2 ~ 0.6

Goals:

- Max. N. eggs in desired class
- Fast EW increase at the beginning
- Flat EW curve after 60 weeks

Brown Chick – flexible in egg weight

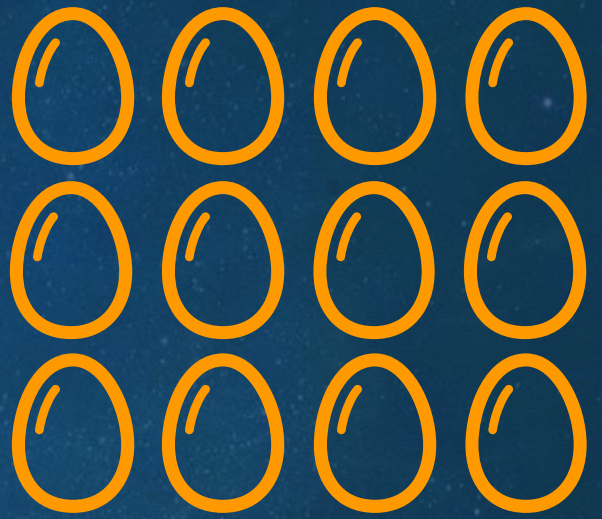
You decide with Management and Nutrition – Our birds adapt

470 Eggs x 64 g

Egg Mass

30,08 kg

460 Eggs x 66 g



Egg Mass

30,36 kg

Rearing: An investment for the future

Not only Costs! - BW & Uniformity: The key for success!

Good Immune System

Feed Intake Capacity

IN ALTERNATIVE SYSTEMS:

Birds eat and drink at different levels

Good bird activity throughout the system

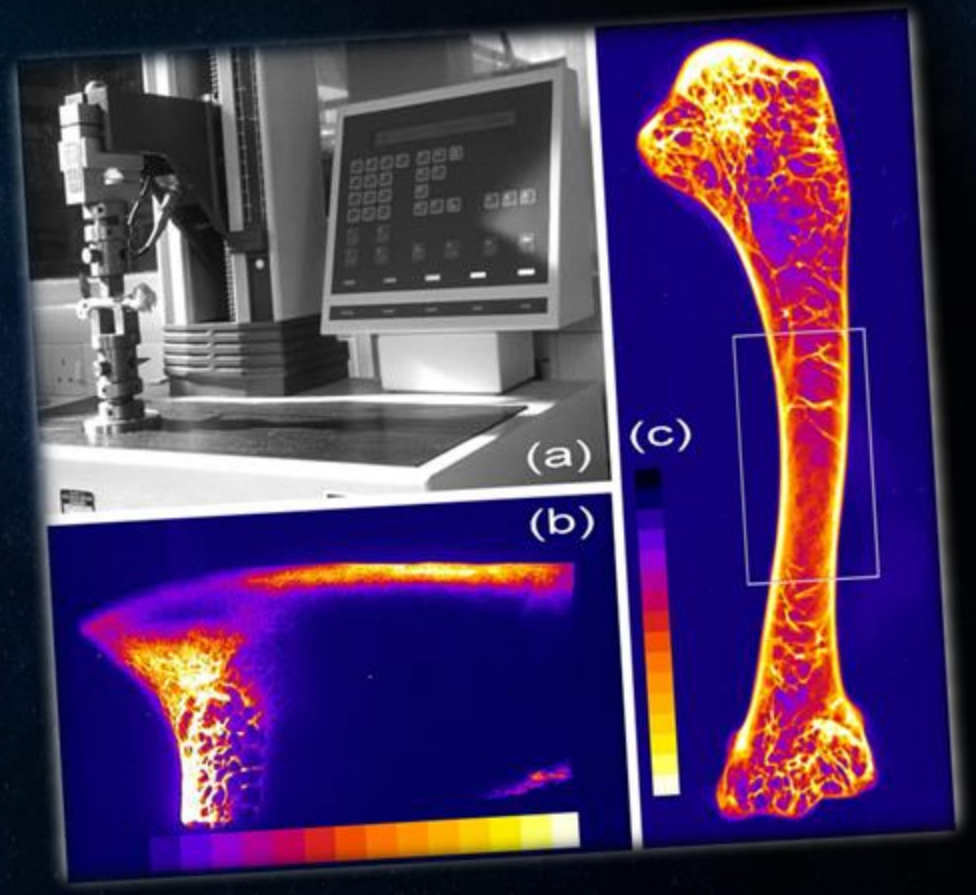
Improve Bone Stability

Palpation

X-Ray Analysis (Tibiotarsus)

Bone Quality

Post-mortem Bone Quality



- ✓ Keel bone is hard to measure and h^2=0.03
- ✓ No neg. correlation with persistency (r_g=+0.25)
- ✓ No link to BS (r_g=±0.1)
- ✓ Neg. correlation with early maturity (r_g=-0.73)
- ✓ **Well-mineralised medullary bone is important for skeleton quality**

(Source: Dunn et al., 2021)

Selection for better feed efficiency

- **Sufficient feed intake at greatest nutrient demand**
- Focus is not only in FCR, but mainly in IOFC
- **No special high-density diet – Flexible in raw material**
- Feed intake according to production

Selection for good eggshell colour

Brown Nick – Makes the difference!

- ✓ Attractive and uniform brown/cream/white shell colour
- ✓ Good shell colour until the end of production

Better behaviour

Selection for low mortality, calmness & good feather cover

Adaptability to different environments









Field Test - Performance recording

Birds tested in several continents

Performance Testing:

- ✓ Egg Production
- ✓ Egg Quality
- ✓ Livability
- ✓ Plumage Condition
- ✓ Pecking

Feed Challenge

Comercial Farms – Crossline Testing

Better behaviour

Free-Range Test

End of beak treatment…??

Selecting for better Beak Shape

Blunt Peak ➔ less injuries

- ✓ Moderate heritability: $h^2 \sim 0.15 - 0.25$
- ✓ Negative correlation to feather cover: $r_g = -0.2$

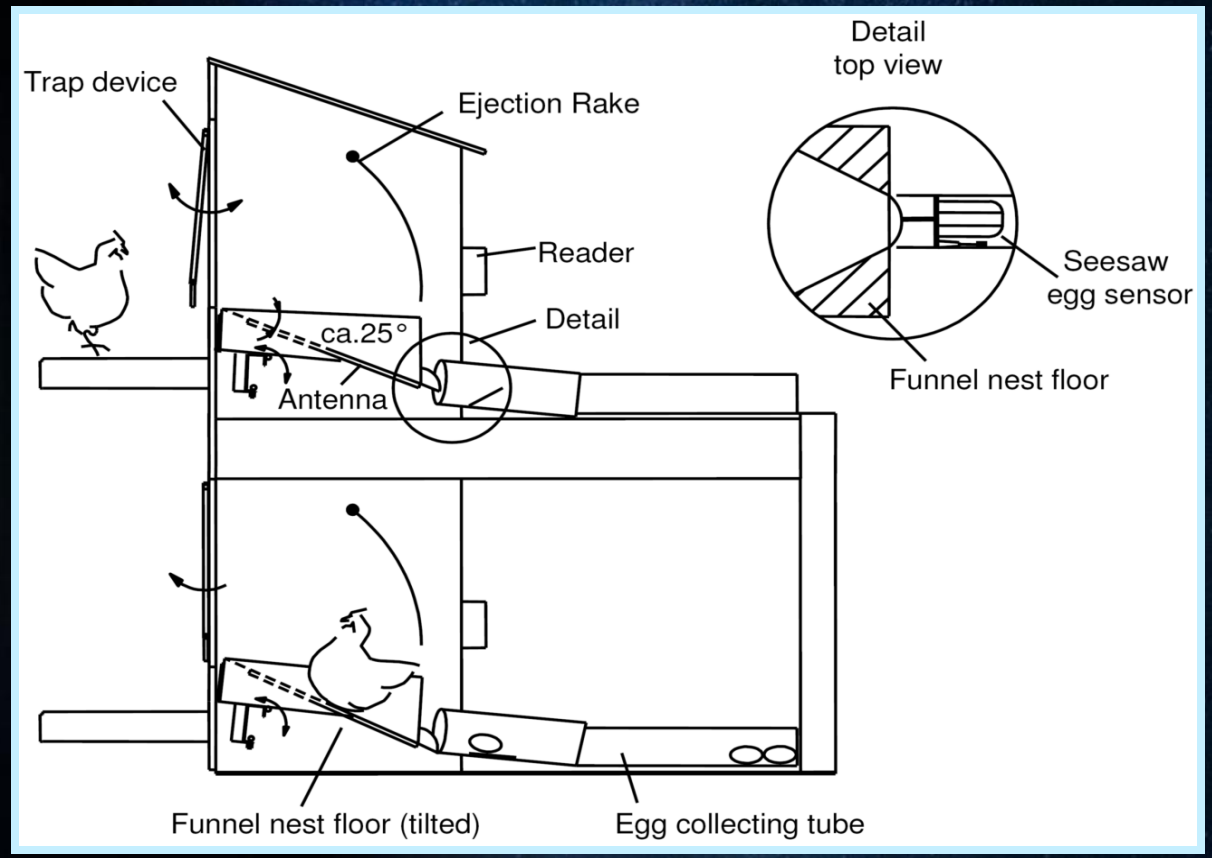
Automatic Trap Nest

Floor System

Automatic Trap Nesting

Increase of Saleable Nest Eggs

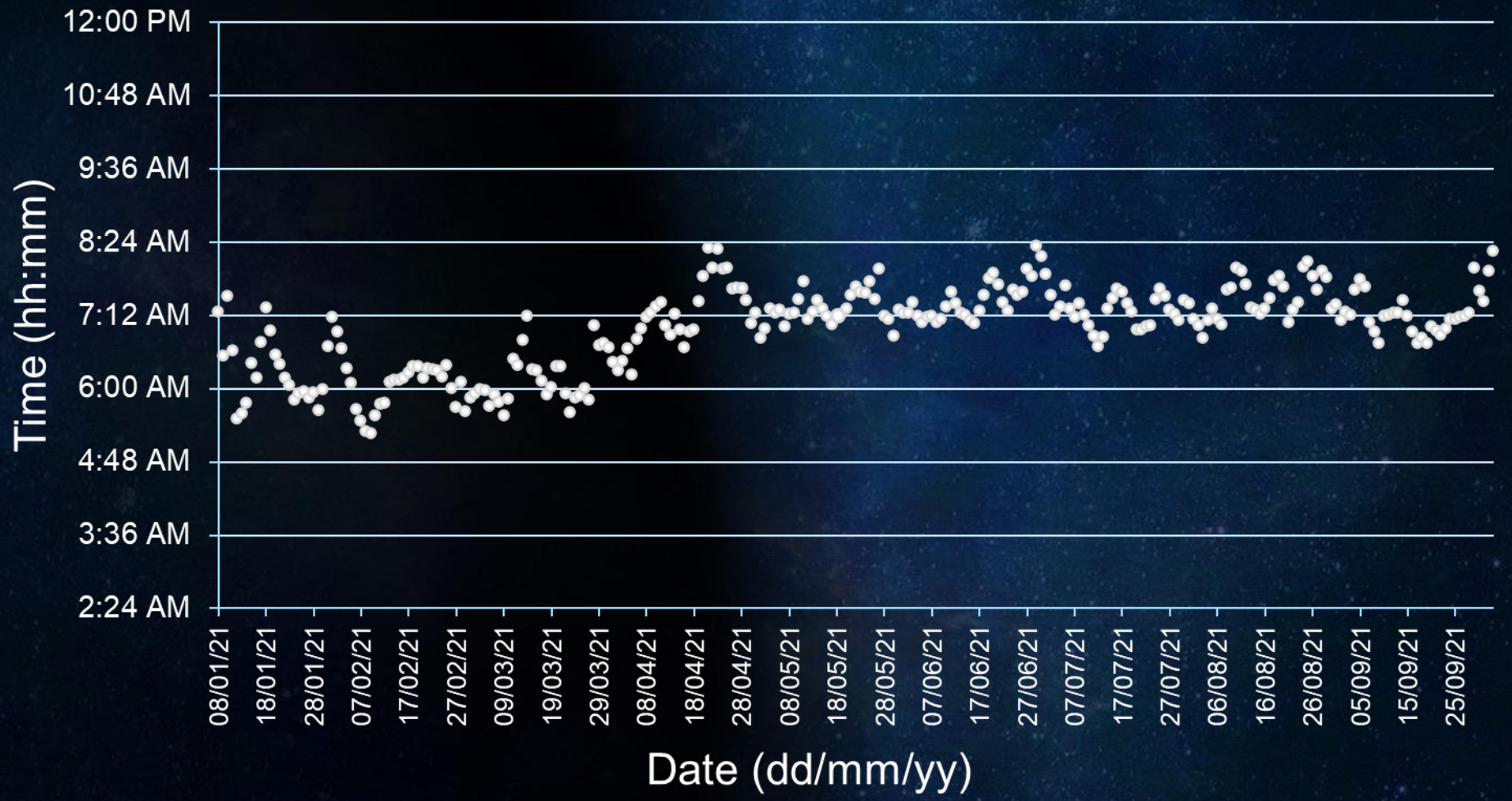
No more!



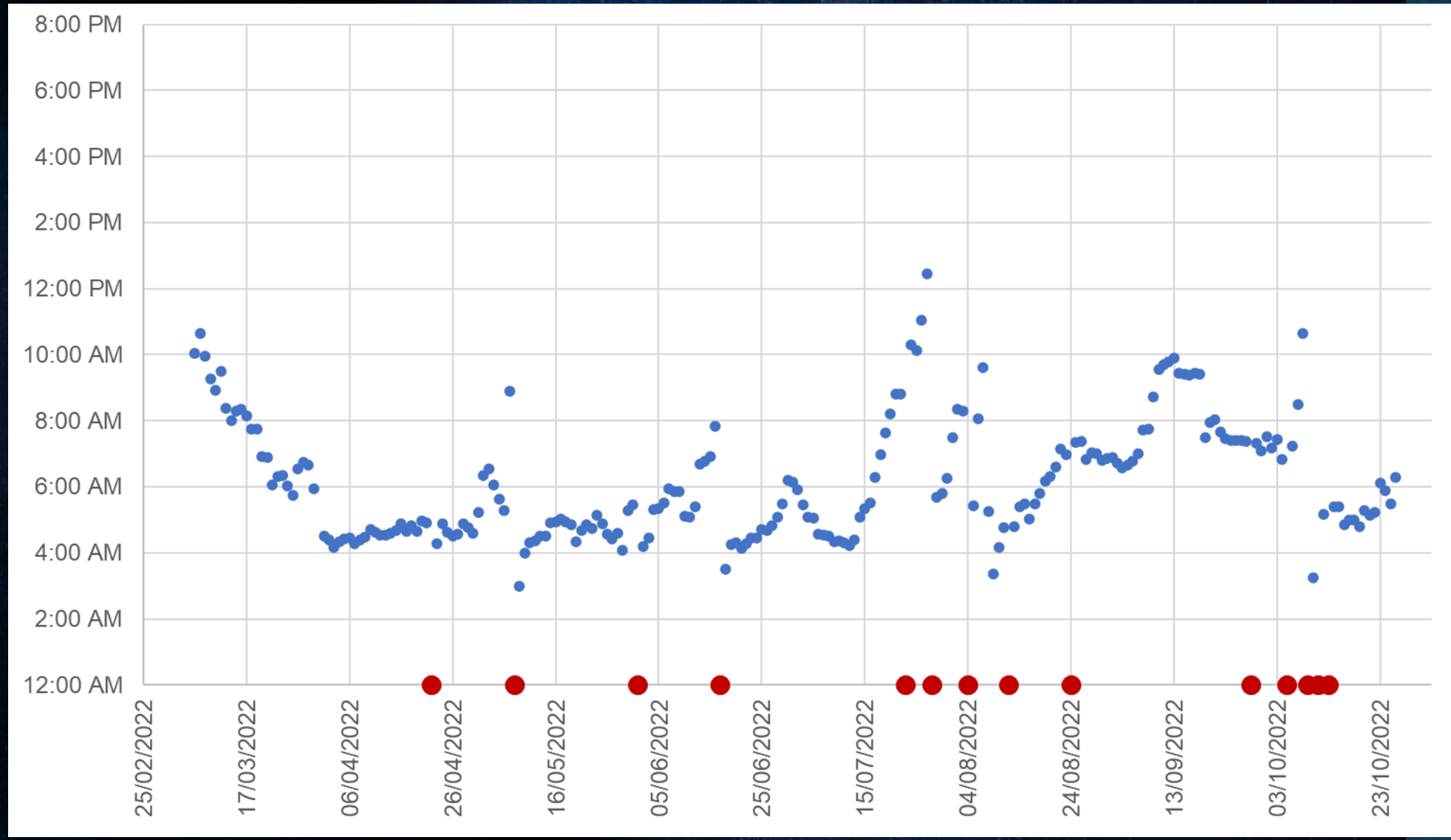
Transponder

Laying time

White egg line – 269 Eggs in 269 production days (100%)



Evaluating Nesting Behaviour

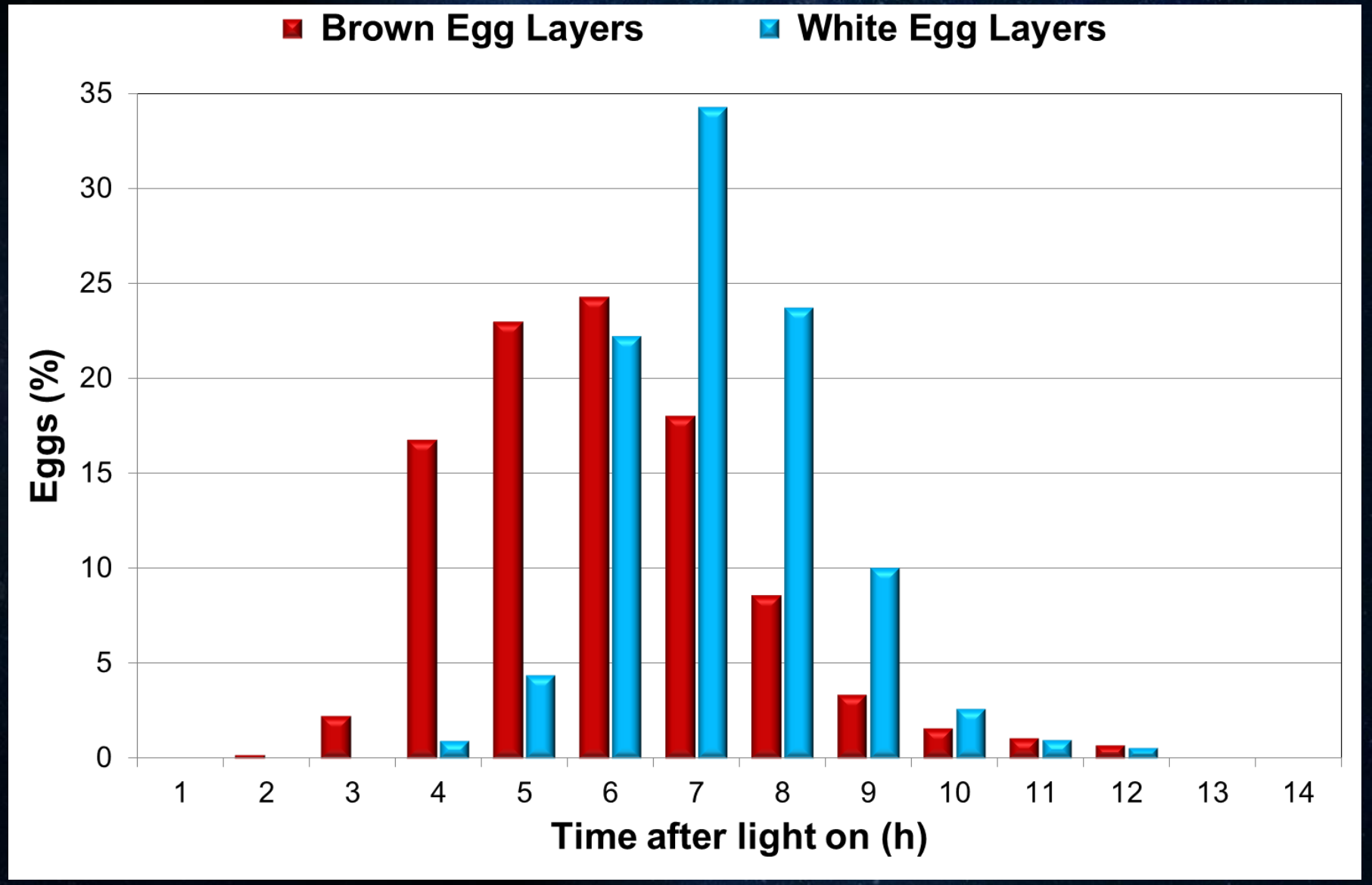


Nesting behaviour

Trait	Brown layer	White layer
Oviposition time	8:00	9:45
Stay in Nest with oviposition	30 min	45 min
Stay in nest without oviposition	10 min	28 min

* Switch on the light at 3:00

Nesting behaviour



Traditional Trap Nest in Russia

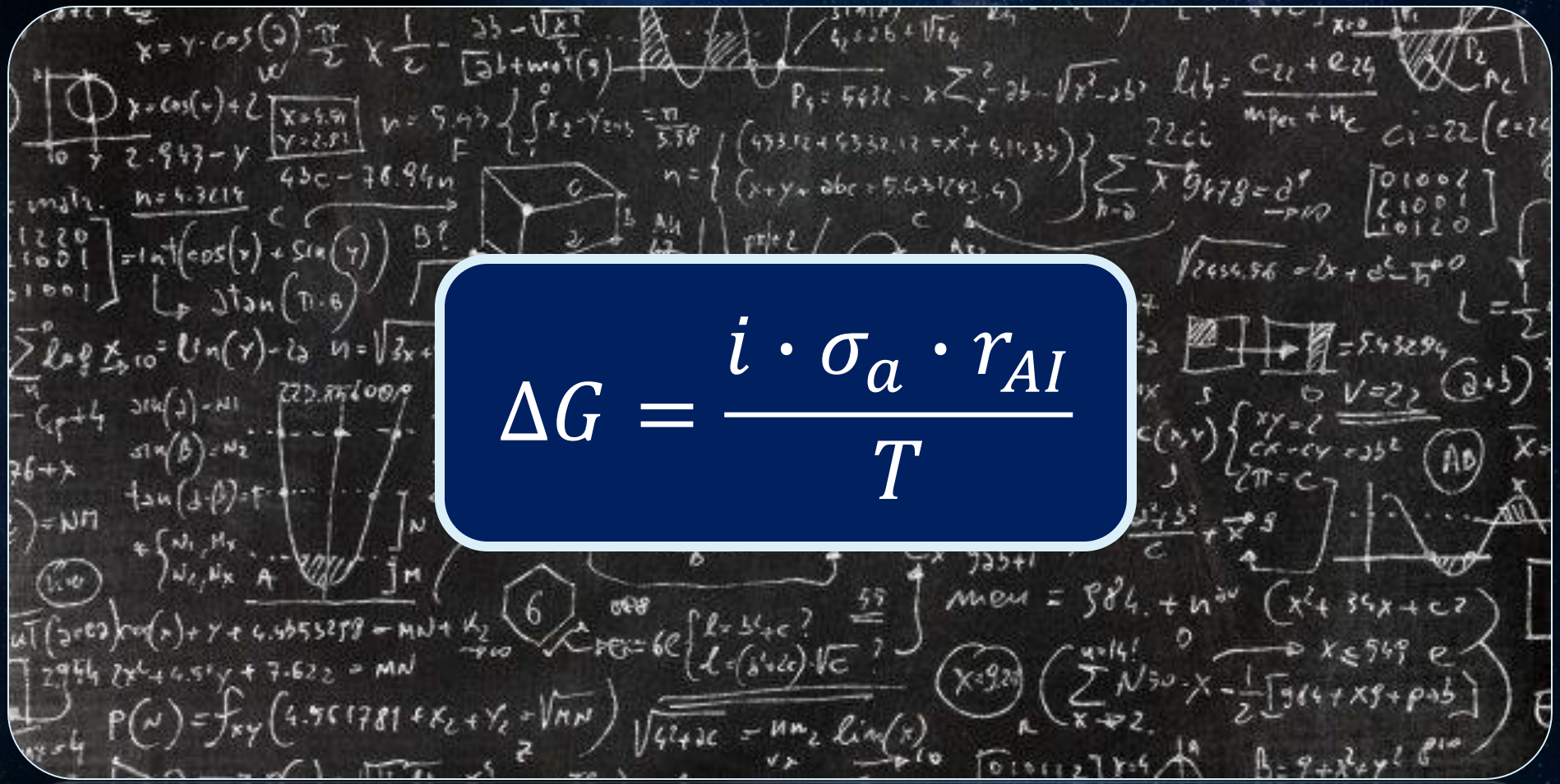
GENOMIC SELECTION

DNA Analysis

- ✓ MD 50k SNP-Array
- ✓ By-product: Pedigree check
- ✓ **Higher accuracy in BVs**
- ✓ Better use of genetic variation
- ✓ Reduce generation interval

More Genetic Gain

Genetic Progress Equation



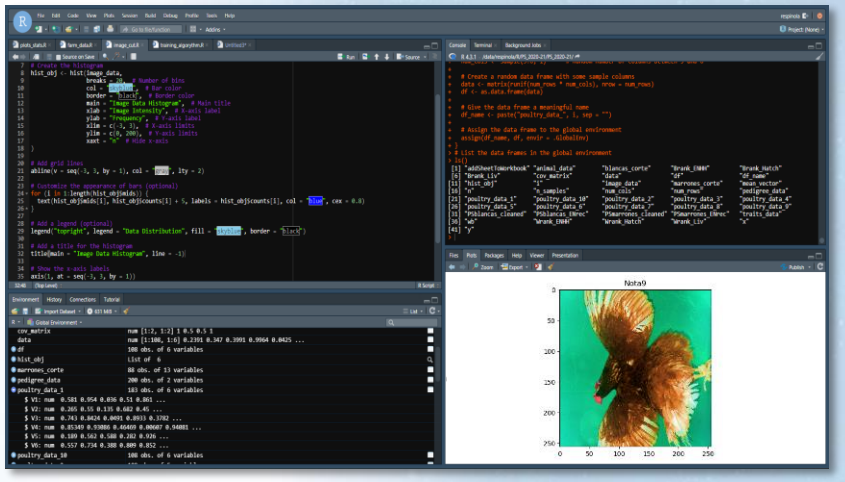
$$\Delta G = \frac{i \cdot \sigma_a \cdot r_{AI}}{T}$$

Application of New Technologies

Birds in cage-free environment - Behaviour

Feather Condition Scoring

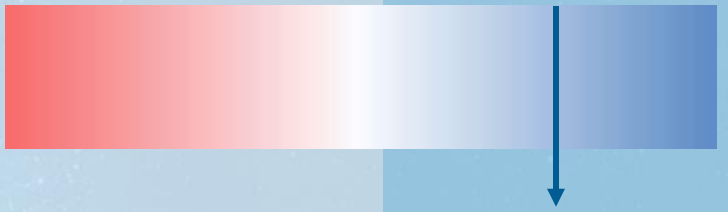
Automated scoring using Cameras + AI



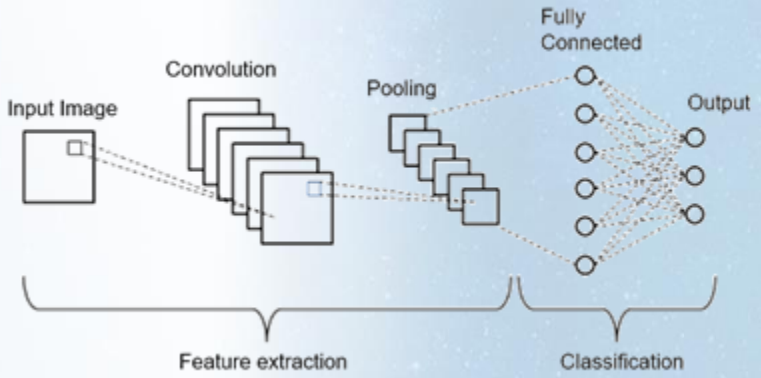
Farm Score:

1	2	3	4	5	6	7	8	9

AI Score:



7.38



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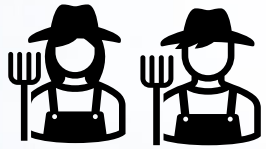
New Traits - Artificial Intelligence

- Automatic data collection
- **Transform data to information:**
  - ✓ Tracking the animal
  - ✓ Activity
  - ✓ Behaviour
  - ✓ Fitness

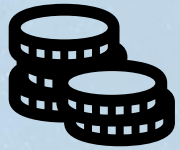

id:36 hen 0.70
id:35 hen 0.70
id:18 hen 0.77
id:47 hen 0.62
id:39 hen 0.69
id:46 hen 0.69
id:15 hen 0.78
id:41 hen 0.68
id:9 hen 0.79
id:23 hen 0.76
id:28 hen 0.73
id:12 hen 0.78
id:21 hen 0.76
id:30 hen 0.73
id:44 hen 0.65
id:27 hen 0.73
id:33 hen 0.70
id:40 hen 0.68
id:22 hen 0.76
id:19 hen 0.77
id:16 hen 0.77
id:45 hen 0.65
id:7 hen 0.80
id:29 hen 0.73
id:11 hen 0.78
id:26 hen 0.74
id:6 hen 0.81
id:14 hen 0.78
id:25 hen 0.74
id:34 hen 0.70
id:10 hen 0.78
id:37 hen 0.69
id:38 hen 0.69
id:13 hen 0.78
id:17 hen 0.77
id:4 hen 0.85
id:24 hen 0.75
id:5 hen 0.83
id:20 hen 0.76
id:1 hen 0.86
id:2 hen 0.85
id:3 hen 0.85
id:8 hen 0.80
hen 0.66

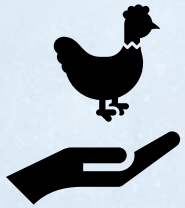
Take Home Message

Added Value Proposition - Sustainability of the Egg Industry



More Production



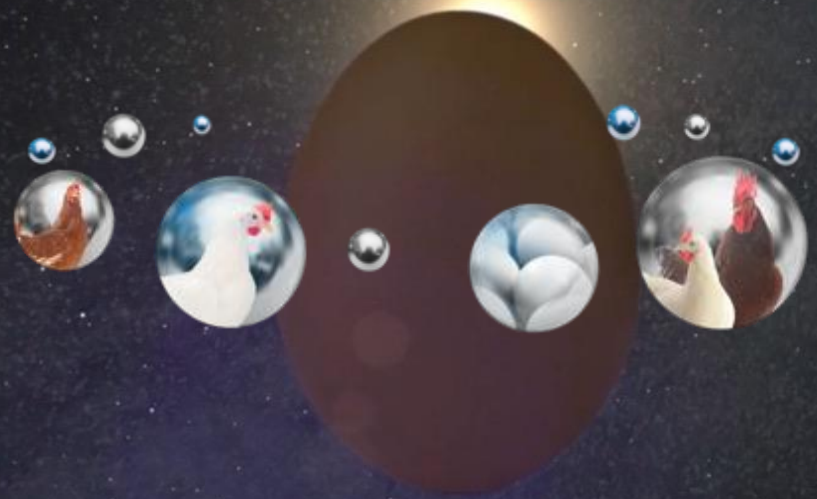


Better Liveability

Higher Efficiency

Greater Adaptability

Thank you for your attention



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