

LA CUMBRE AVÍCOLA LATINOAMERICANA



PPP: Applying Technology at the Farm & Results at the Processing Plant

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AGRITECH Livestock Spain

In collaboration with:



The Farm Opposing Forces

- Increasing needs for protein supply beyond 2030
- vs.
- Decreasing farmers & improving genetics

=

Well-proven Real-Time & Real-Life
Competitive **Technology 4 Productivity** (PLF)

- ❑ Real-Time farm status info (early decisions)
- ❑ Farm processes Automation (valuable work)
- ❑ Traceability Evidences (breeding certification)



Technology...what do you want it for? Key Benefits

Nowadays Breeding: **Productivity** Follow-up + Animal Welfare + Traceability

Proven-Technology means **better Transformation Index (FCR & IPE)**

- ❑ ... *better survival ratio of chicks transport conditions from hatchery to farm and from farm to processing plant*
- ❑ ... *better sanitary breeding conditions and Animal Welfare*
- ❑ ... *increasing of transformation index during fattening*
- ❑ ... *better prognosis of chicken weight for processing plant scheduling*

e.g.: Integration Turnover: 50 M€, EBITDA 3,5 M€

Improvement: 60 K€/year Profit

From IPE 380 to 408

**Zootechnical Efficiency
&
Operational Profitability**



Solution Integration is key : Technology 8 Steps Ecosystem

Real-Time Livestock Integrated System



How it Works?



Field & Cloud Data Registration and Analytics

Chick
Transport



Air Quality
NH3, CO2,
Temp, RH



Automated
Remote
Weight Control



Silo Feeding
Consumption
Control



Water
Consumption
Control

Activity Farm
(Vacc.
Schedule,
Mortality, An.
Behaviour,
visual
observations)

Warning
Alerts by
Role
(farmer,
Medical,
production
manag.)



What our “real customer” needs?

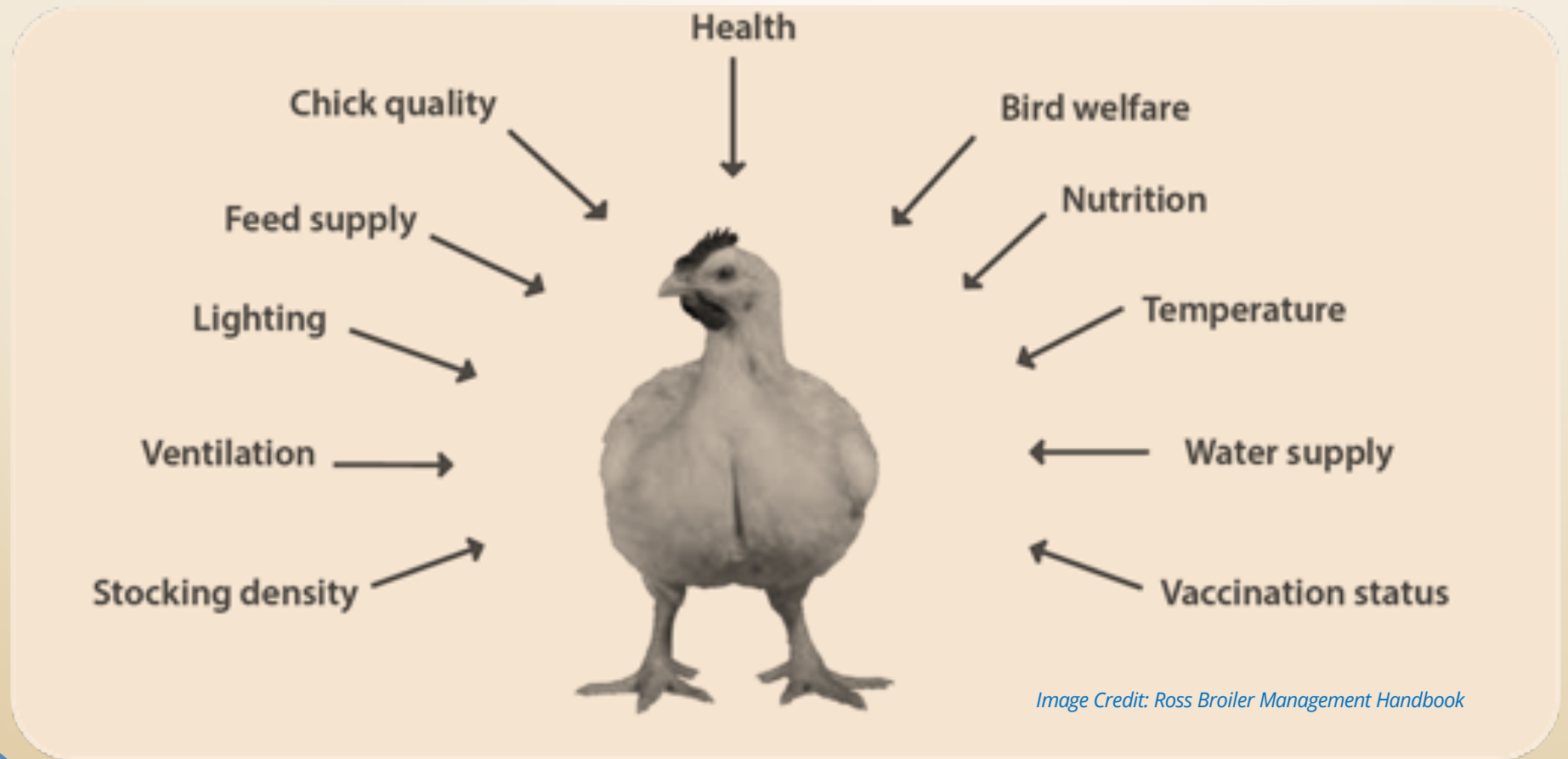
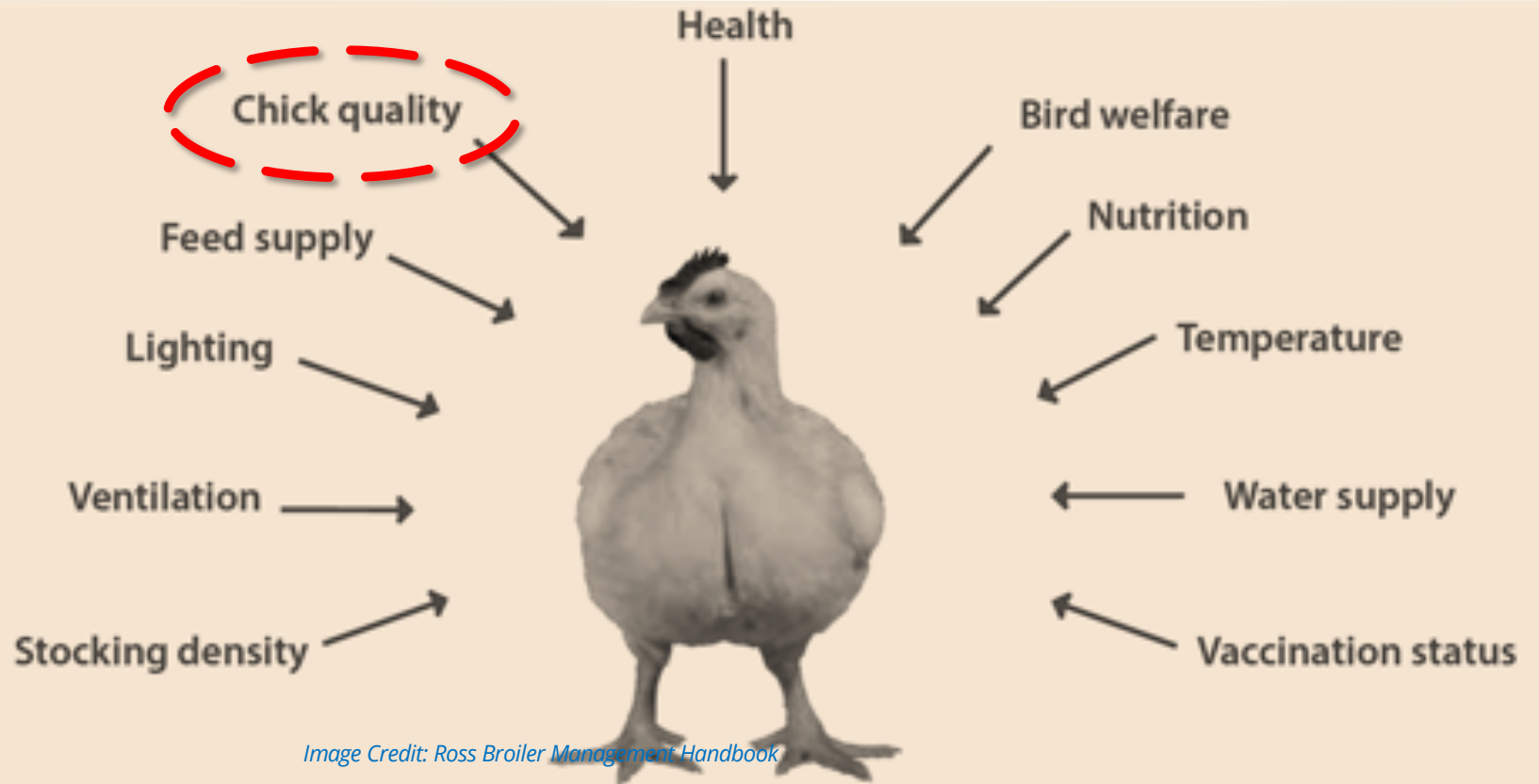


Image Credit: Ross Broiler Management Handbook



1: Hatchery Chicks To Farm





1: Tracking Transport and environmental control of chicks from Hatchery To Farm





1: Autonomous IoT monitoring Track&Air Quality



Cabeza Tractora

Carro 1	Carro 3	Carro 5
17141801	17141804	17141807
17141802	17141805	17141808
17141803	17141806	17141809
Carro 26	Carro 28	Carro 30
17141810	17141813	17141816
17141811	17141814	17141817
17141812	17141815	17141818
		17141829
Carro 51	Carro 53	Carro 55
17141819	17141822	17141825
17141820	17141823	17141826
17141821	17141824	17141827

Ejemplo colocación Carro 5

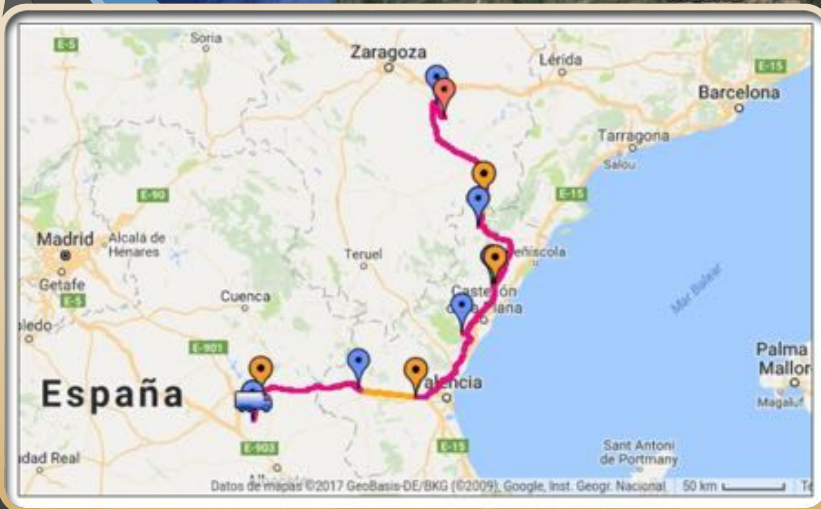
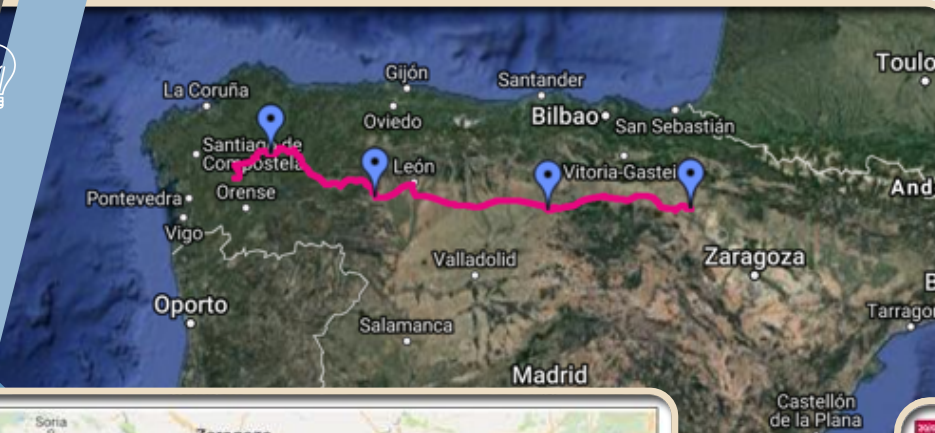


Sonda 17141807

1: IoT monitoring box distribution

Sonda 17141809

1: Truck Route Real-Time Tracking & Stops




2018/03/17 16:39

1 Salida

Salida gratuita de Trochadero Sárraga
Inicio: 20-04-2017 20:38:30

2 Parada 1


Parada 1 detectada (Distancia: 511.02613230256 m.);
Inicio: 20-04-2017 13:39:26
Fin: 20-04-2017 13:14:11



Consulta en Google Maps

3 Parada 2


Parada 2 detectada (Distancia: 500.02622198030 m.);
Inicio: 20-04-2017 14:36:17
Fin: 20-04-2017 14:04:20



Consulta en Google Maps


4 Parada 3

Parada 3 detectada (Distancia: 547.81832729540 m.);
Inicio: 20-04-2017 14:44:28
Fin: 20-04-2017 13:04:03



5 Parada 4 (GRANJA)


Parada 4 detectada (Distancia: 526.75350917171 m.);
Inicio: 20-04-2017 18:11:48
Fin: 20-04-2017 18:25:04



Consulta en Google Maps

6 Parada 7 (GRANJA)


Parada 7 detectada (Distancia: 500.54033341046 m.);
Inicio: 20-04-2017 19:19:32
Fin: 20-04-2017 19:27:48



Consulta en Google Maps

7 Parada 8

Parada 8 detectada (Distancia: 536.25030899045 m.);
Inicio: 20-04-2017 21:49:28
Fin: 20-04-2017 21:55:15



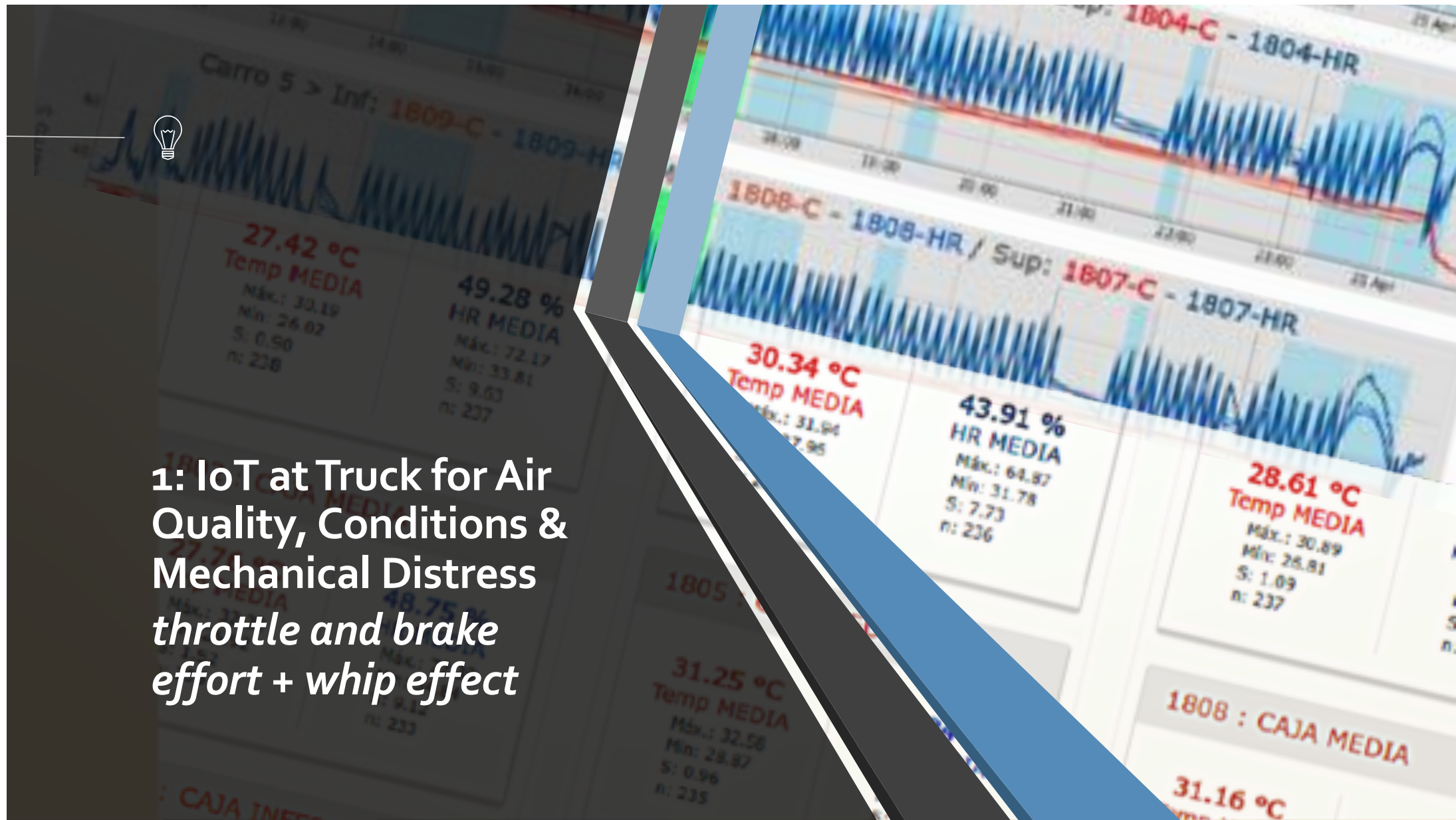
Consulta en Google Maps

8 Parada 9 (GRANJA)

Parada 9 detectada (Distancia: 582.37272463707 m.);

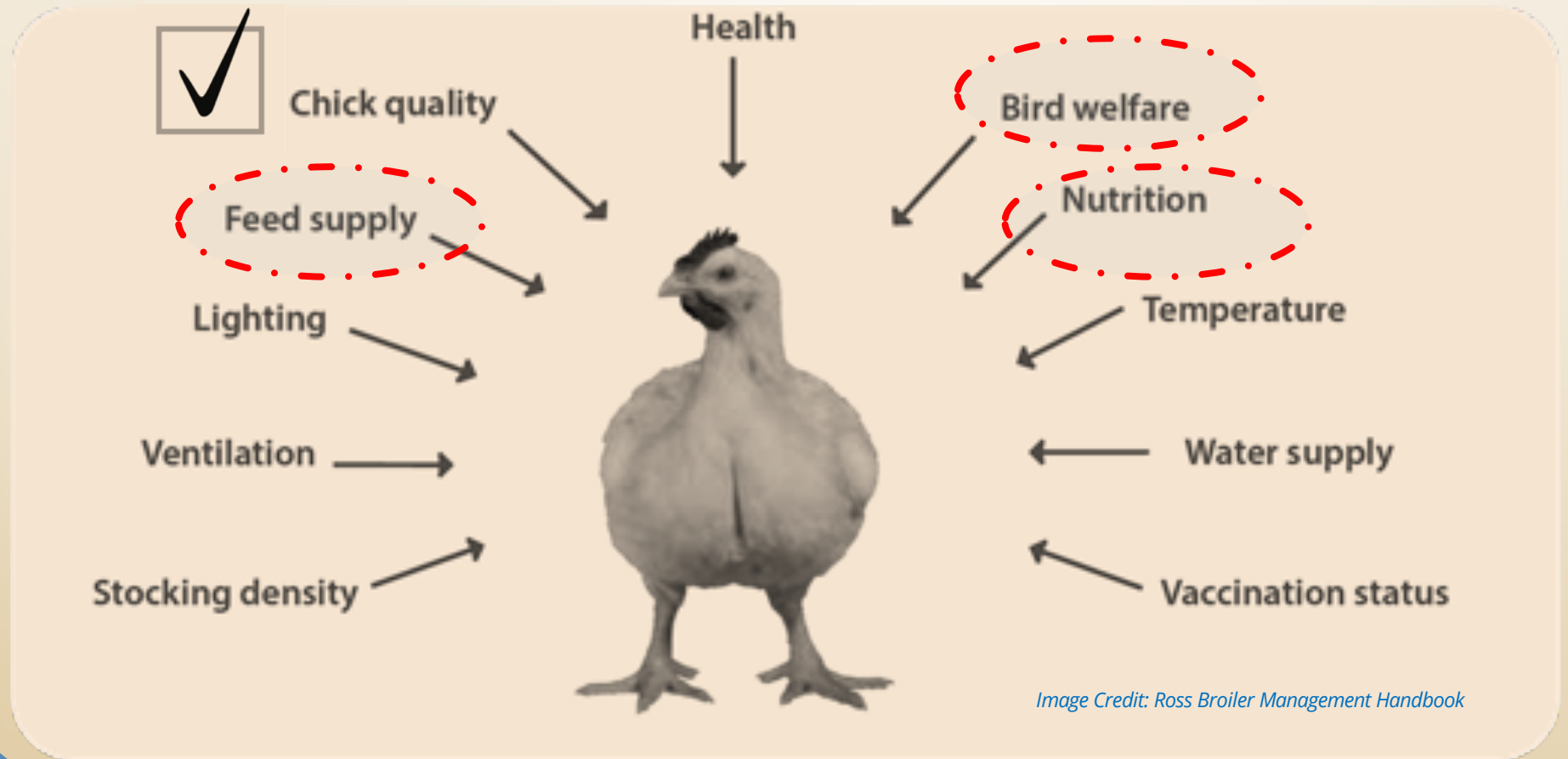


**1: IoT at Truck for Air Quality, Conditions & Mechanical Distress
*throttle and brake effort + whip effect***





2: Feeding Control



2: Feeding Control by Dynamic Silo Levelling

Suministro silos-piensos

En este apartado se realiza la gestión de pienso y silos

Suministro Silos-Piensos

Show 10 entries

Buscar

Fecha	Albaran	Cantidad	Origen	Destino	Ref. Pienso	Descripción	Estado	Camion	Transportista
2019-10-17 10:10:00	159156	5060	ALMACEN CENTRAL	N3 - SILO 1	1	PIENSO DE INICIO	FLUIDO	0198JMG	OSCAR CASTRO
2019-10-28 10:22:03	159401	4480	ALMACEN CENTRAL	N3 - SILO 1	2	PIENSO DE CRECIMIENTO RAPIDO	FLUIDO	0528JMG	DANIEL
2019-10-29 09:42:48	159489	2220	ALMACEN CENTRAL	N3 - SILO 1	3	PIENSO DE CRECIMIENTO 30%	FLUIDO	0184JMG	DAVID
2019-11-11 11:17:30	159649	8060	ALMACEN CENTRAL	N3 - SILO 2	3	PIENSO DE CRECIMIENTO 30%	FLUIDO	0397JLL	MARTIN BARROS
2019-11-11 11:18:35	159611	8860	ALMACEN CENTRAL	N3 - SILO 1	3	PIENSO DE CRECIMIENTO 30%	FLUIDO	0528JMG	JUAN
2019-11-12 08:52:25	159539	7920	ALMACEN CENTRAL	N3 - SILO 2	3	PIENSO DE CRECIMIENTO 30%	FLUIDO	0397JLL	MARTIN BARROS
2019-11-12 08:52:25	159539	7920	ALMACEN CENTRAL	N3 - SILO 2	3	PIENSO DE CRECIMIENTO 30%	FLUIDO	0397JLL	MARTIN BARROS
2019-11-13 09:44:02	159702	4000	ALMACEN CENTRAL	N3 - SILO 1	4	PIENSO DE MADURACION	FLUIDO	8734KGL	PABLO ALEMPARTE

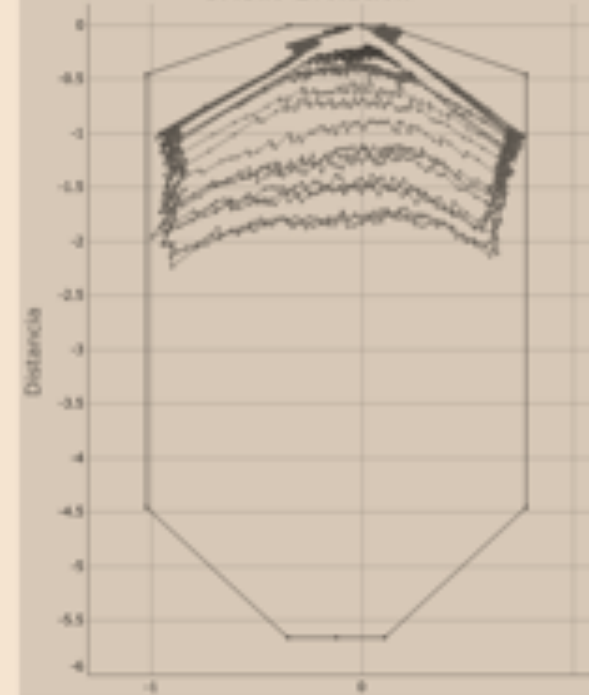
16/11/2019

3:4:11 62.56%

Silo (62.56%)



SMSilo Evolución





2: Feeding Control by Silo Level monitoring





3: Hidratation - Drinking Water supply

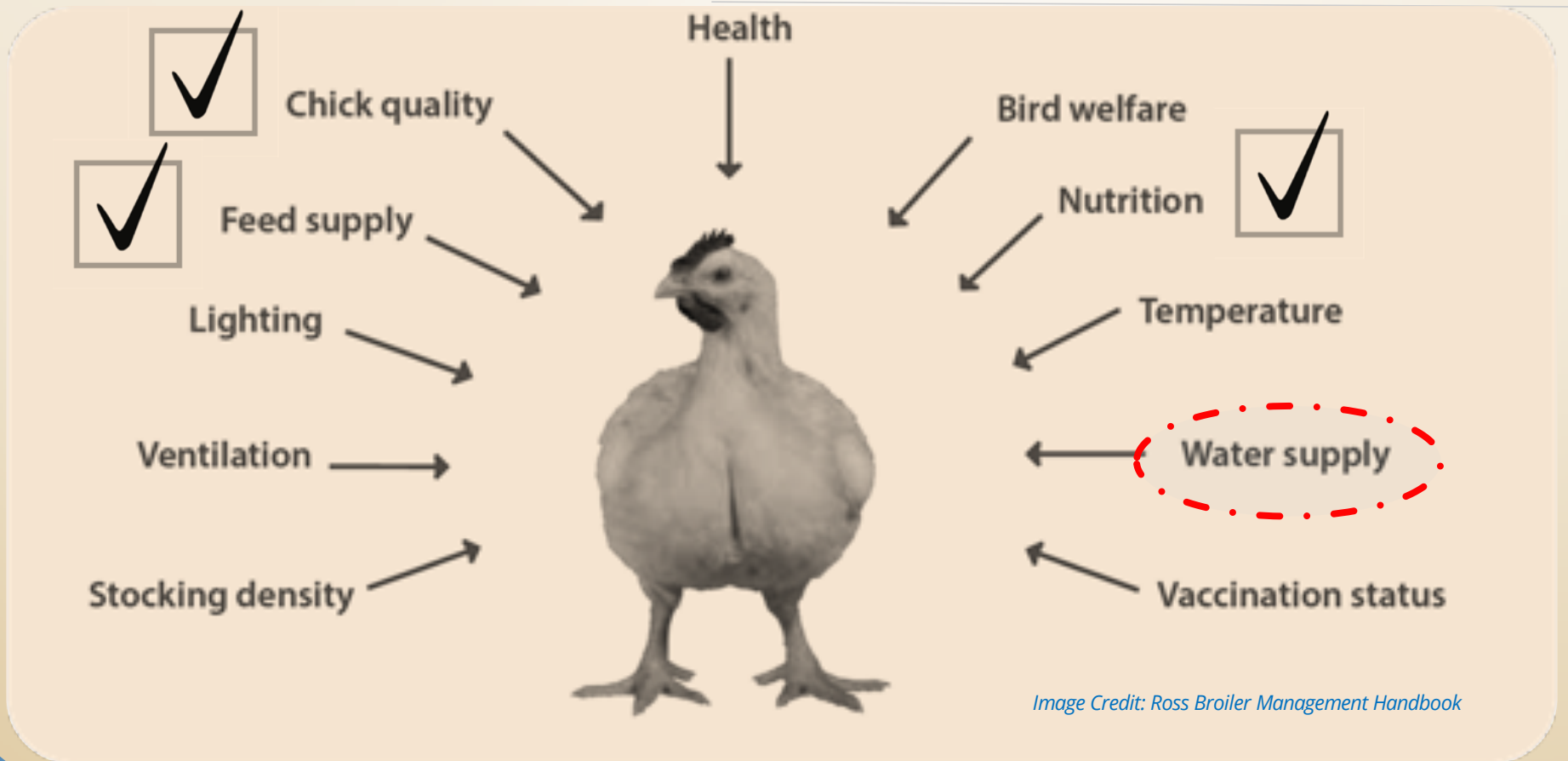
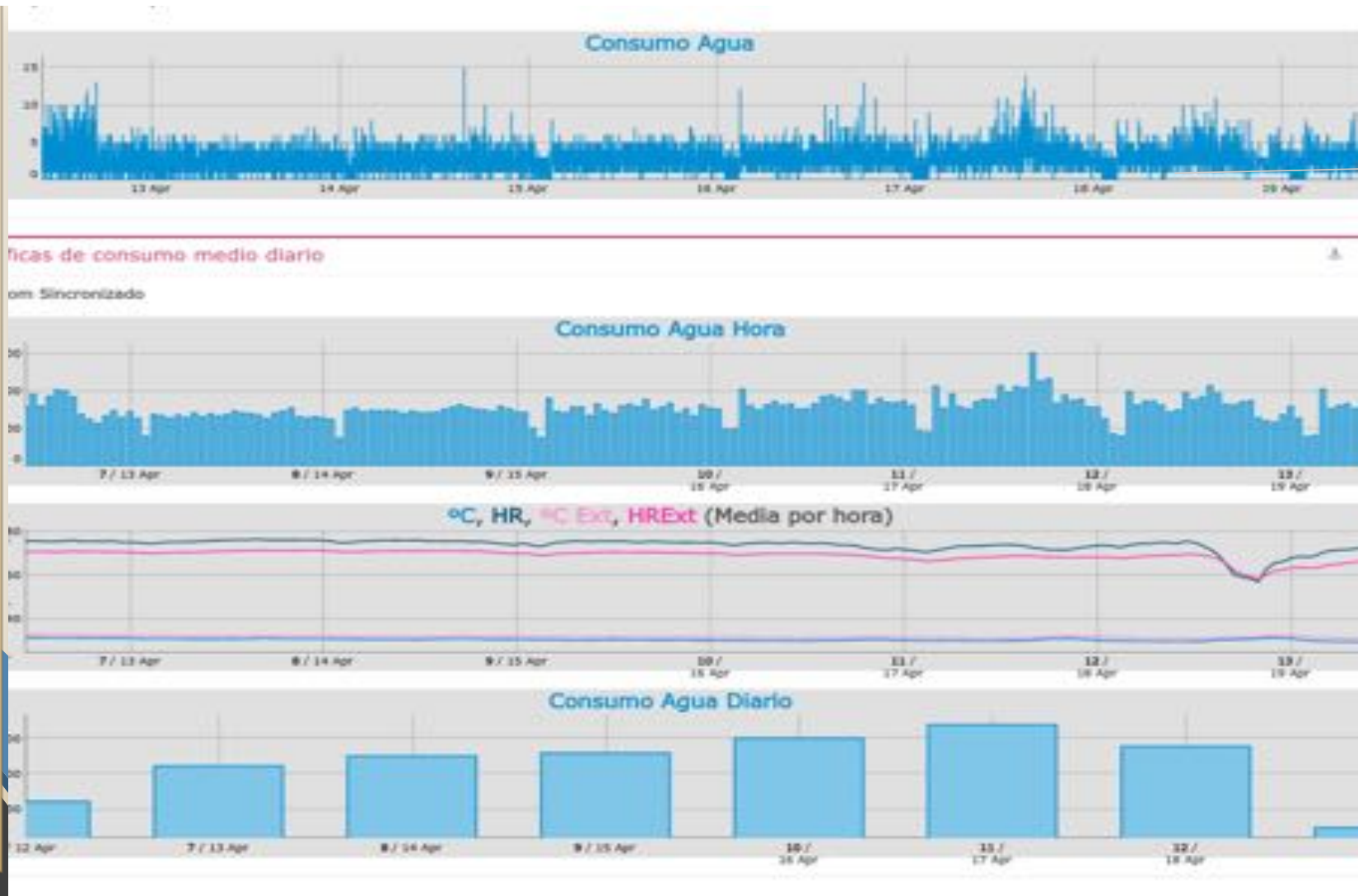


Image Credit: Ross Broiler Management Handbook

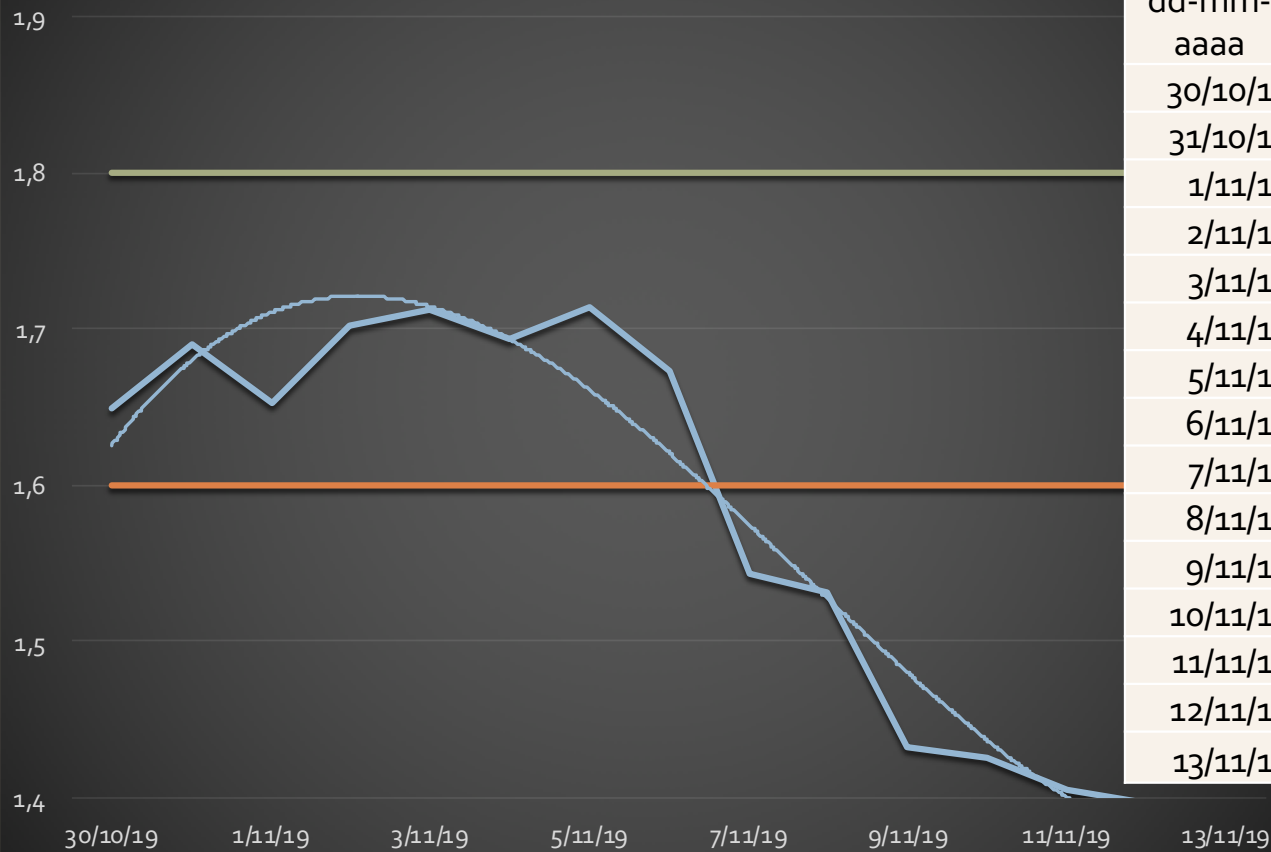


3: Hidratation – Drinking Water supply

4: Ratio & KPI Evolution & Treshold Evaluation



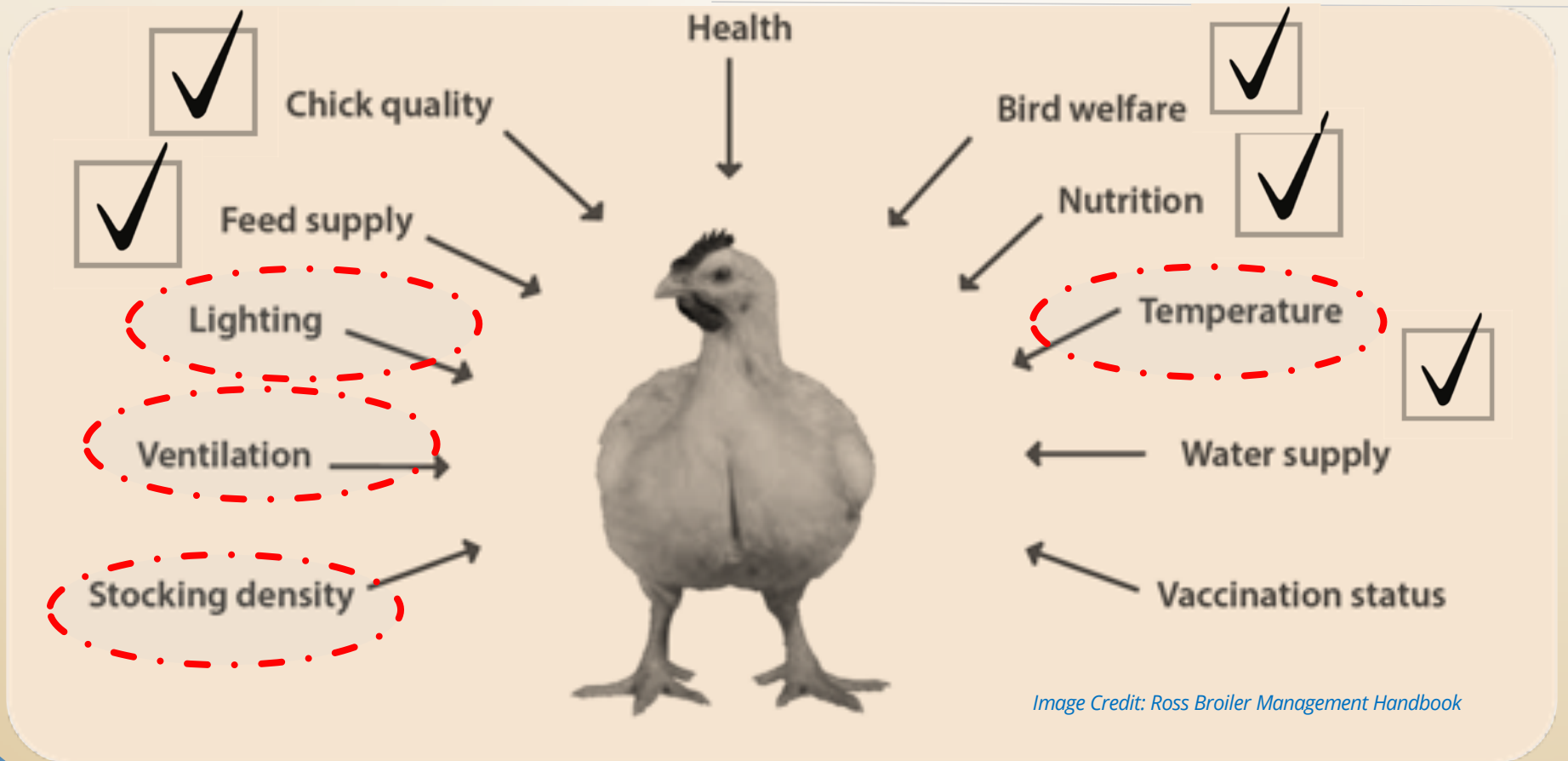
Feeding/Drinking Ratio



Fecha	Consumo Pienso Nave	Consumo Agua Nave	Ratio D/F
dd-mm-aaaa	(kg)	(litros)	(l/kg)
30/10/19	1845	3044	1,65
31/10/19	1896	3204	1,69
1/11/19	1971	3259	1,653
2/11/19	2022	3443	1,703
3/11/19	2073	3550	1,713
4/11/19	2123	3597	1,694
5/11/19	2174	3726	1,714
6/11/19	2199	3679	1,673
7/11/19	2249	3471	1,543
8/11/19	2275	3485	1,532
9/11/19	2300	3294	1,432
10/11/19	2325	3314	1,425
11/11/19	2351	3303	1,405
12/11/19	2376	3317	1,396
13/11/19	2376	3222	1,356



5: Stocking Density, Distribution & B.W. Uniformity



5: Flock Stock CV trough Environmental Control





6: Fattening up and Transformation Index

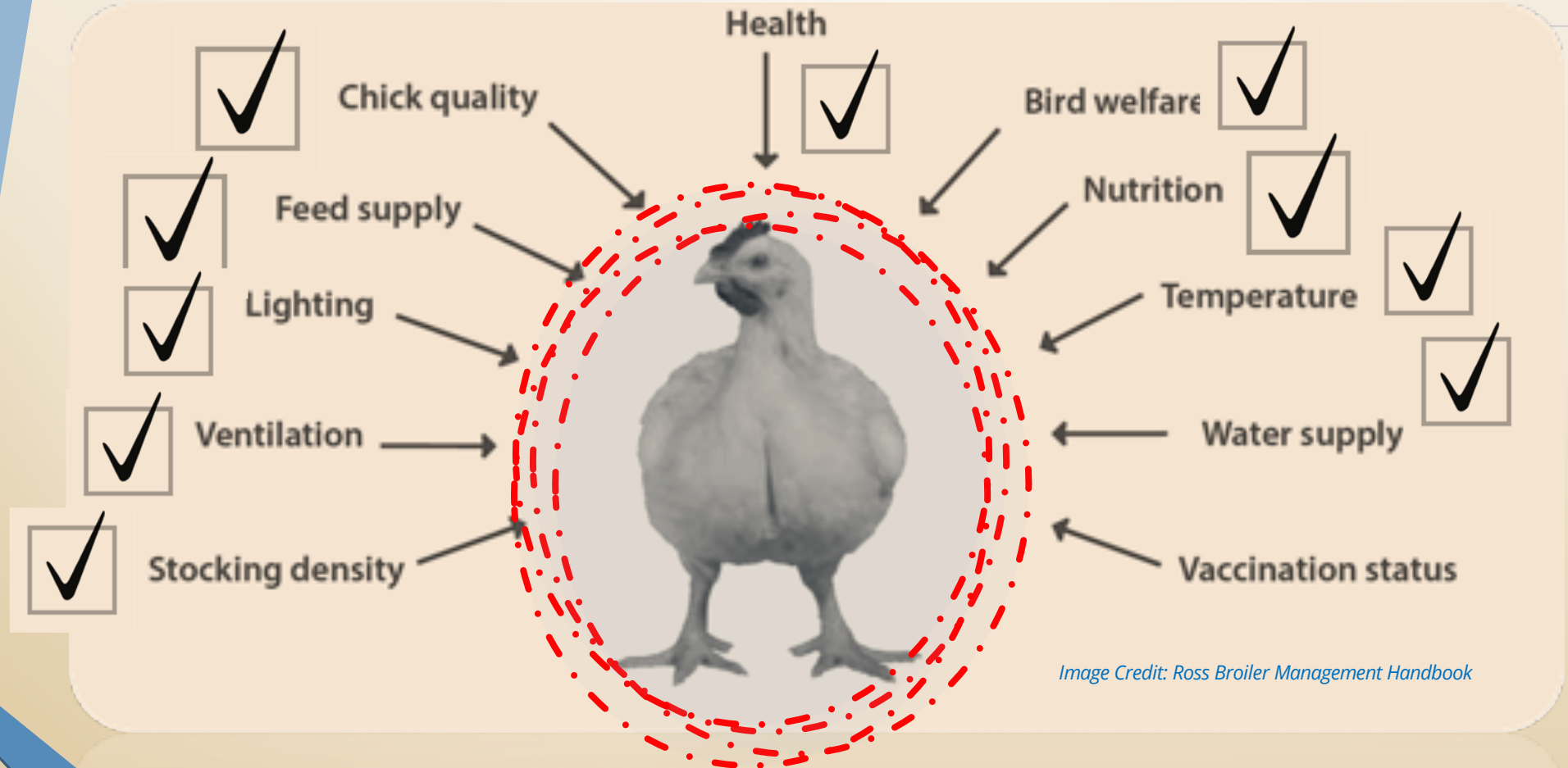


Image Credit: Ross Broiler Management Handbook

6: Transformation – AutoWeight Control beyond gravity



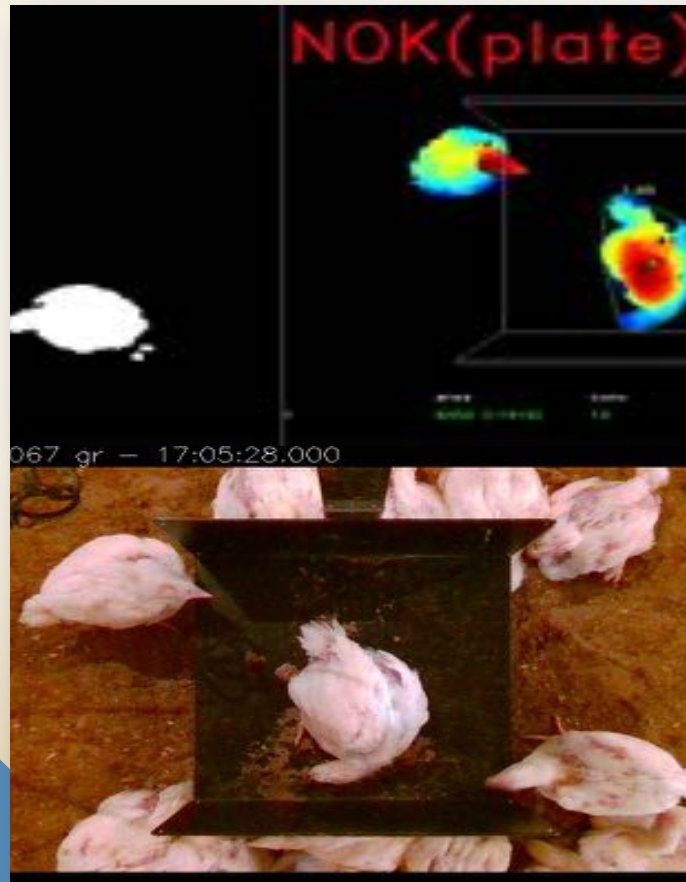
No gravity principle
(roman scale)

No modelling ... how to
distinguish a good female
from a bad male ?

How many animals am I
Weighing?

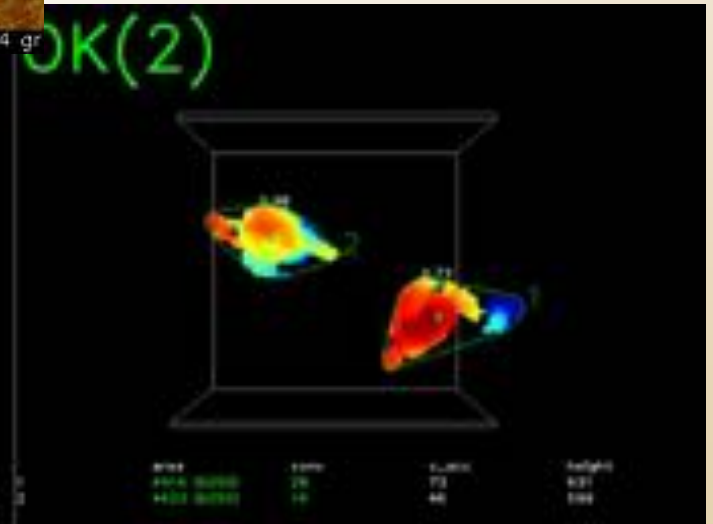
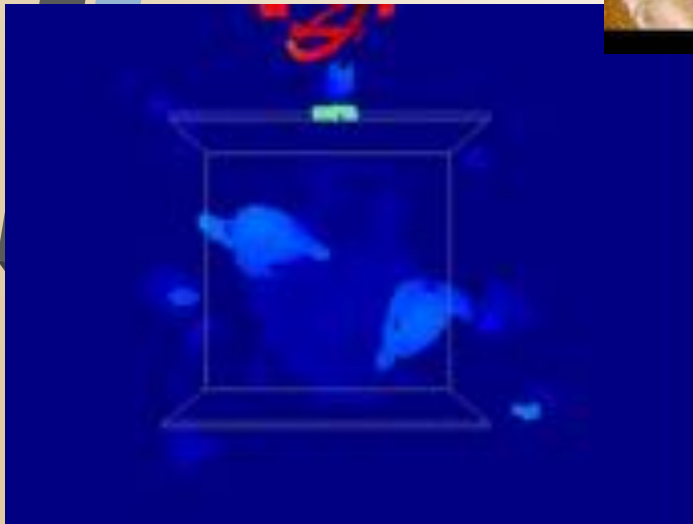


6- it is good to believe ... but better to control
If wrong ... discard and only quality data



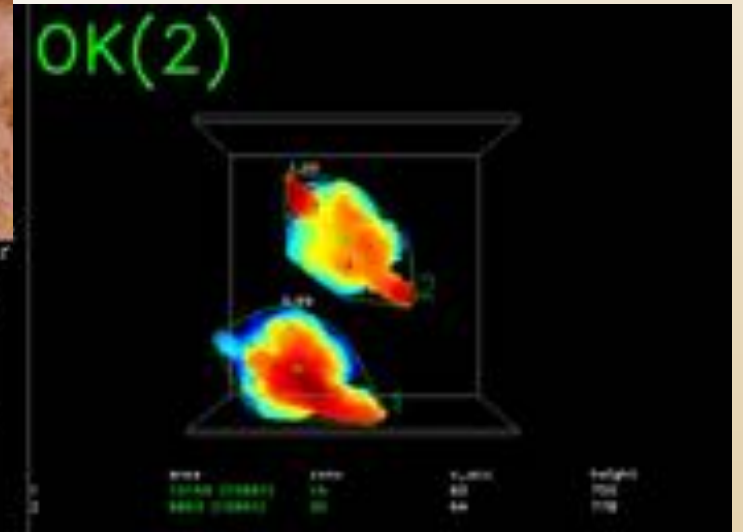


6- Breeding: day 20



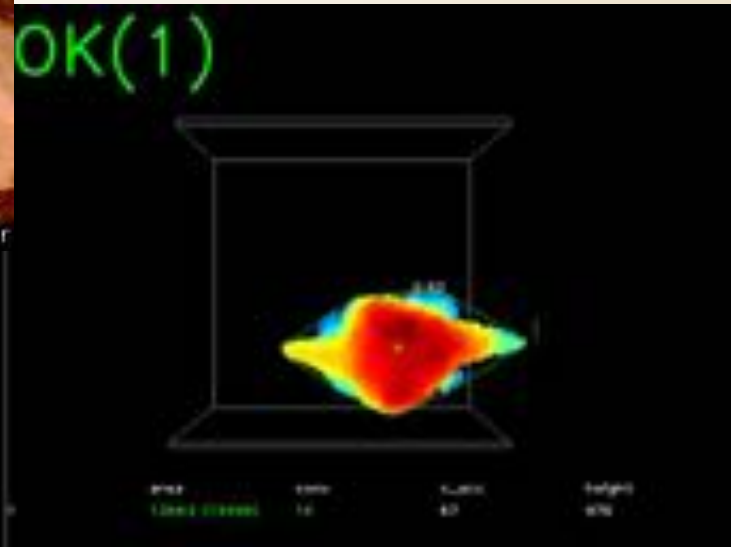
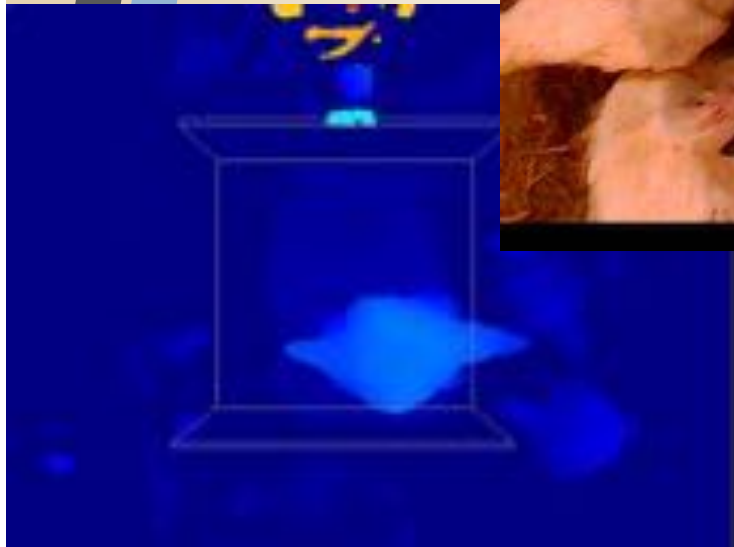


6- Breeding: day 30





6- Breeding: day 35





Pesada Automática: datos d40

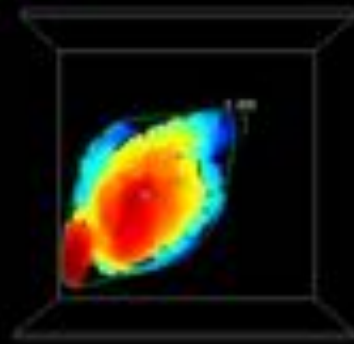


1 animal - mean: 2265 gr

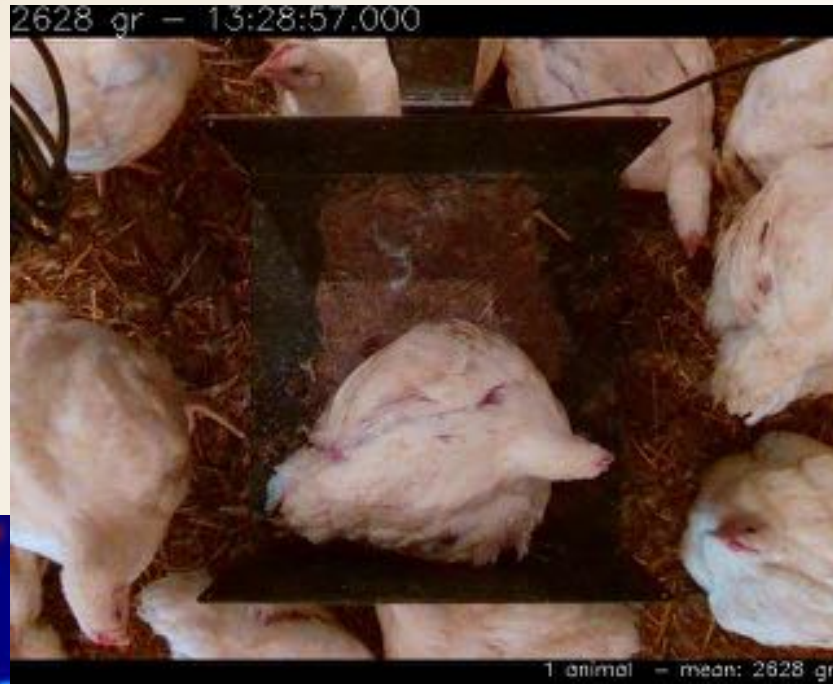
6- Breeding: day 40



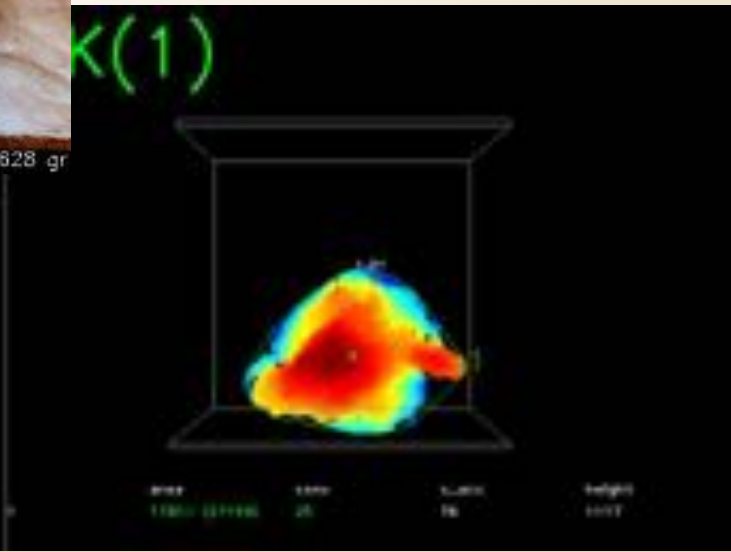
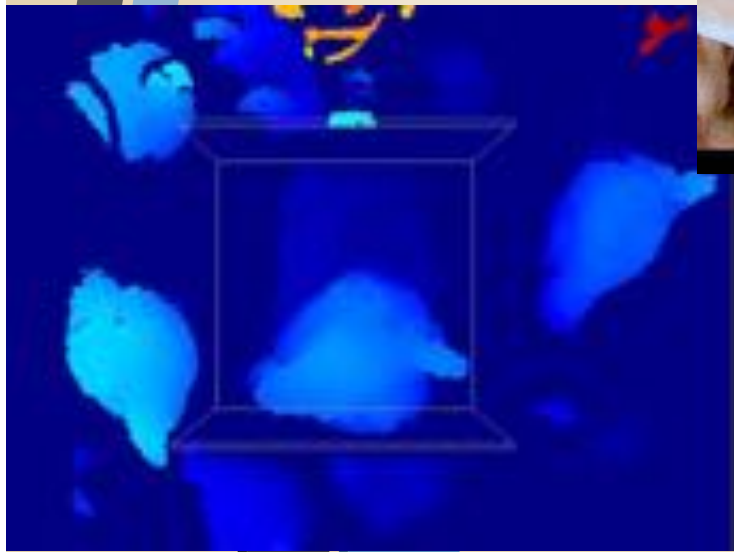
OK(1)



area	center	radius	height
14000 (2265 gr)	14	12	1100



6- Breeding: day45



WEIGHT HISTÓRICO DE PEGO

Selección de lote

20

Seleccionar el día del lote



WEIGHTK: 004_20 (8/10/2019)

2.4741 Kg

3.1.1000 (17) 20.1.1.10
Peso: 1.0000 - 40.1.1.1.1.1

Datos obtenidos el día 8/10/2019 correspondientes al día 39 del lote

Actividad:

95

Huella visible:

95

Máximo absoluto:

2.34

Huella absoluta:

1.80

INDICAR *

Curvas de crecimiento utilizadas:

● Peces Híbridos Magnético

● Peces Híbridos Referencia

1.000

1.500

2.000

2.500

Die Lote (40)

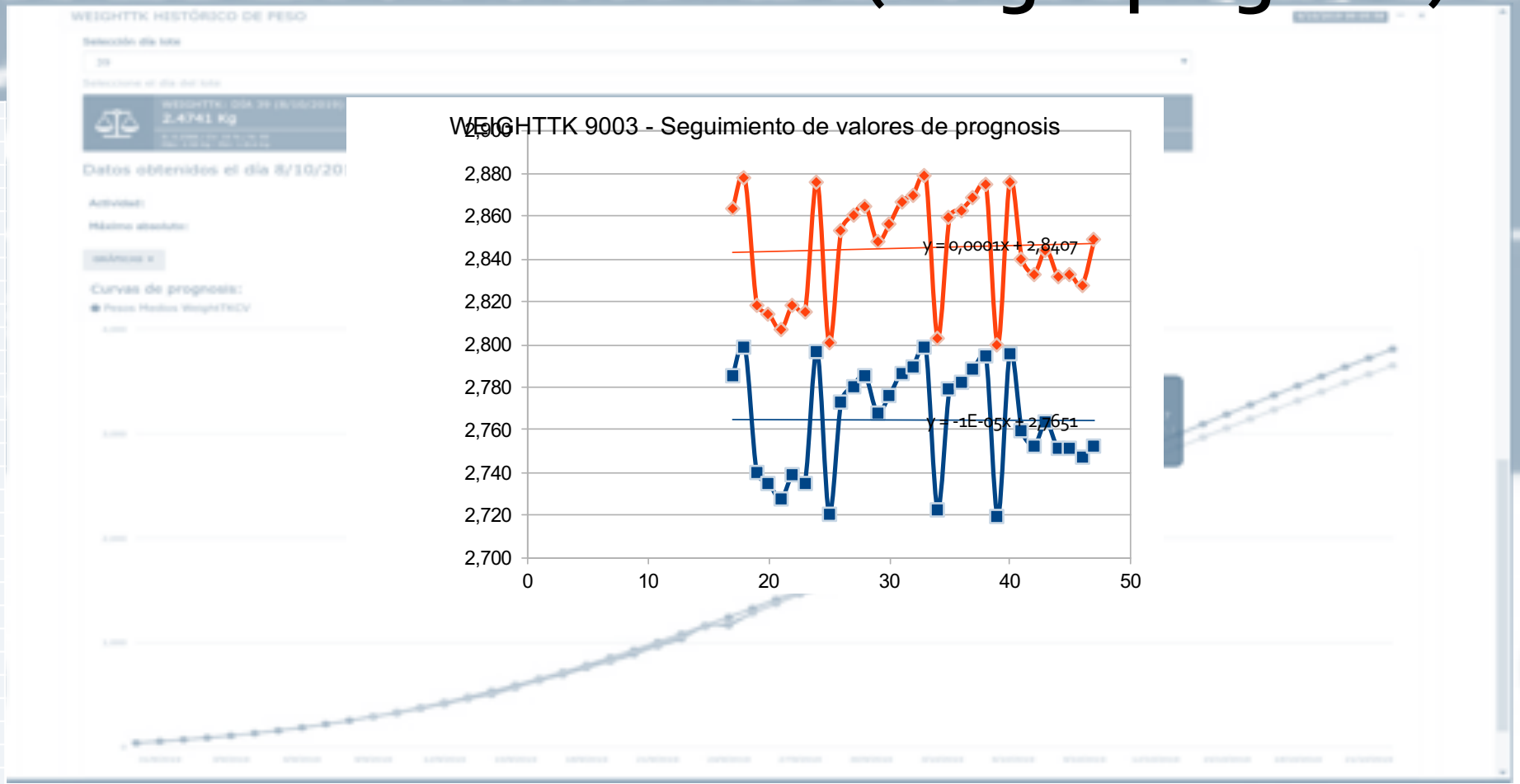
8/10/2019

Peso Referencia: 2.34

6- Real-Time Weight Evolution Data

6- Daily forecast extraction dates for batch (weight prognose)

LOTE	FECHA	DÍA LOTE	PESO M. PROGNOSIS	PESO M. TEÓRICO	DIFERENCIAL MATADERO
1003	2019-10-07	7	0,172	0,188	
1003	2019-10-08	8	0,208	0,220	
1003	2019-10-09	9	0,239	0,254	
1003	2019-10-10	10	0,273	0,292	
1003	2019-10-11	11	0,304	0,333	
1003	2019-10-12	12	0,338	0,376	
1003	2019-10-13	13	0,379	0,423	
1003	2019-10-14	14	0,433	0,473	
1003	2019-10-15	15	0,478	0,526	
1003	2019-10-16	16	0,523	0,582	
1003	2019-10-17	17	0,582	0,640	
1003	2019-10-18	18	0,653	0,701	
1003	2019-10-19	19	0,704	0,765	
1003	2019-10-20	20	0,756	0,831	
1003	2019-10-21	21	0,830	0,899	
1003	2019-10-22	22	0,892	0,969	
1003	2019-10-23	23	0,943	1,042	
1003	2019-10-24	24	1,027	1,116	
1003	2019-10-25	25	1,063	1,191	
1003	2019-10-26	26	1,146	1,268	
1003	2019-10-27	27	1,227	1,347	
1003	2019-10-28	28	1,289	1,427	
1003	2019-10-29	29	1,375	1,507	
1003	2019-10-30	30	1,465	1,589	
1003	2019-10-31	31	1,549	1,671	
1003	2019-11-01	32	1,640	1,754	
1003	2019-11-02	33	1,726	1,838	0,4%
1003	2019-11-03	34	1,785	1,922	



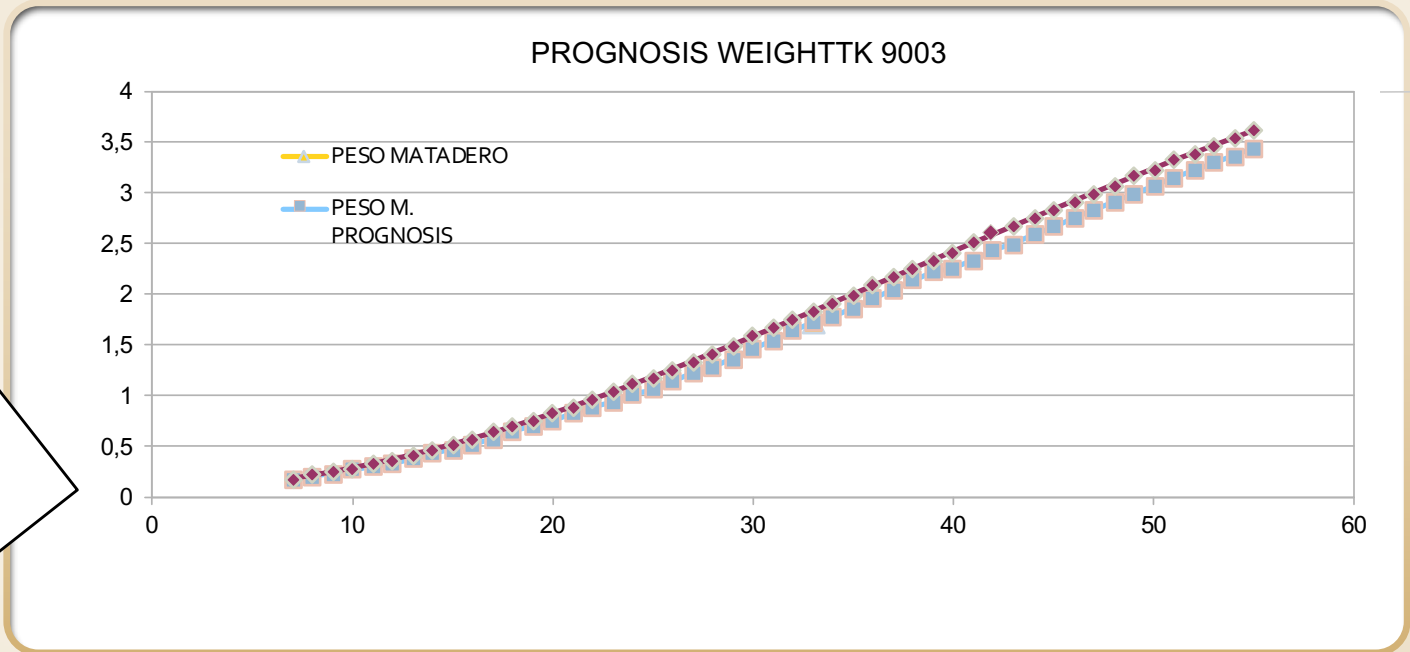
CURVA PROGNOSIS Y TEÓRICA WEIGHTTK 9003							
DÍA LOTE ANALISIS	DEVICE	ID LOTE	FECHA	DÍA LOTE	PESO M. PROGNOSIS	PESO M. TEÓRICO	DIFERENCIAL MATADERO
46	9003	1003	2019-10-07	7	0,172	0,188	
46	9003	1003	2019-10-08	8	0,208	0,220	
46	9003	1003	2019-10-09	9	0,239	0,254	
46	9003	1003	2019-10-10	10	0,273	0,292	
46	9003	1003	2019-10-11	11	0,304	0,333	
46	9003	1003	2019-10-12	12	0,338	0,376	
46	9003	1003	2019-10-13	13	0,379	0,423	
46	9003	1003	2019-10-14	14	0,433	0,473	
46	9003	1003	2019-10-15	15	0,478	0,526	
46	9003	1003	2019-10-16	16	0,523	0,582	
46	9003	1003	2019-10-17	17	0,582	0,640	
46	9003	1003	2019-10-18	18	0,653	0,701	
46	9003	1003	2019-10-19	19	0,704	0,765	
46	9003	1003	2019-10-20	20	0,756	0,831	
46	9003	1003	2019-10-21	21	0,830	0,899	
46	9003	1003	2019-10-22	22	0,892	0,969	
46	9003	1003	2019-10-23	23	0,943	1,042	
46	9003	1003	2019-10-24	24	1,017	1,116	
46	9003	1003	2019-10-25	25	1,063	1,191	
46	9003	1003	2019-10-26	26	1,146	1,268	
46	9003	1003	2019-10-27	27	1,227	1,347	
46	9003	1003	2019-10-28	28	1,289	1,427	
46	9003	1003	2019-10-29	29	1,375	1,507	
46	9003	1003	2019-10-30	30	1,465	1,589	
46	9003	1003	2019-10-31	31	1,549	1,671	
46	9003	1003	2019-11-01	32	1,640	1,754	
46	9003	1003	2019-11-02	33	1,726	1,838	
46	9003	1003	2019-11-03	34	1,785	1,922	0,4%
46	9003	1003	2019-11-04	35	1,871	2,006	
46	9003	1003	2019-11-05	36	1,960	2,090	
46	9003	1003	2019-11-06	37	2,051	2,175	
46	9003	1003	2019-11-07	38	2,139	2,259	
46	9003	1003	2019-11-08	39	2,220	2,344	
46	9003	1003	2019-11-09	40	2,266	2,428	
46	9003	1003	2019-11-10	41	2,343	2,512	
46	9003	1003	2019-11-11	42	2,426	2,595	
46	9003	1003	2019-11-12	43	2,506	2,678	
46	9003	1003	2019-11-13	44	2,590	2,761	
46	9003	1003	2019-11-14	45	2,667	2,843	
46	9003	1003	2019-11-15	46	2,753	2,924	
46	9003	1003	2019-11-16	47	2,834	3,005	
46	9003	1003	2019-11-17	48	2,933	3,085	
46	9003	1003	2019-11-18	49	2,993	3,165	
46	9003	1003	2019-11-19	50	3,070	3,243	

6- Weight Distribution and CV

Or how to Prevent hidden losses at Processing Plant



Planning for Sales & Logistics



6- Weight Prognose for commercial planning of stock availability for customers supply



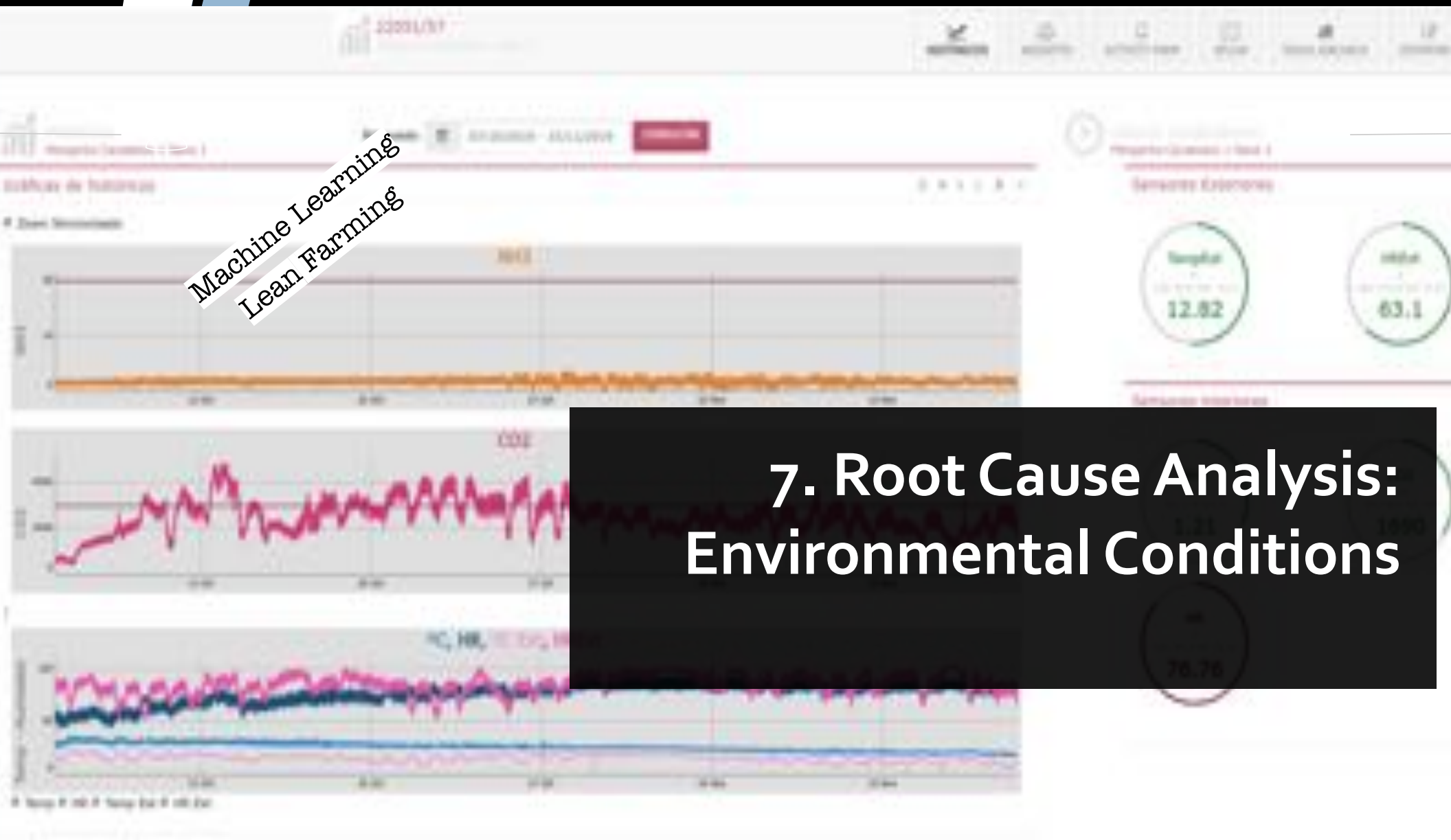
Early Alerts
(when still in control)

7. How to proceed
when something
went wrong?



Machine Learning
Lean Farming

7. Root Cause Analysis: Environmental Conditions



8- When not automation ... digitalization

(breeding batch, mortality, operating conditions, biosecurity control, ...)



Connected Barn
Smart Management

