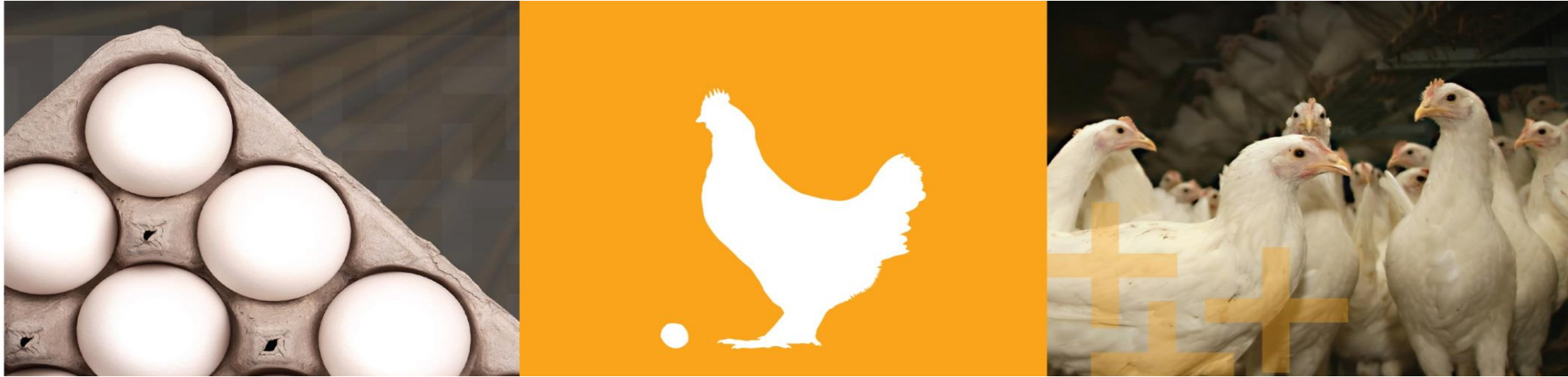


# Transitioning to alternative housing systems (cage-free)



**Martine Bourgeois, agr.**  
June 16, 2021



- 2 barns x 20,000 white egg layers (aviary)
- 2 barns x 50,000 white egg layers (aviary)
- 1 barn x 20,000 replacement pullets (aviary)
- 1 barn x 50,000 replacement pullets (aviary)
- 450 hectares of land (corn, soya, wheat, sunflower, oats) in organic production or in transition
- 5,800 maple trees in organic production



- 12 barns x 5,000 brown egg layers in organic production (on floor & outdoor access)
- 2 barns x 16,000 brown egg layers in organic production (aviary & outdoor access)
- 6 barns x 5,000 replacement pullets in organic production (on floor & slats)
- 1 barn x 16,000 replacement pullets in organic production (aviary)



# Presentation plan

**1**

**Key recommendations of management during rearing in aviary systems**

**2**

**From rearing to production barn**

**3**

**Real results of % lay productions**

**4**

**Observed problems & solutions**

# Rearing = key for success

1. Need good start:
  - Good ambient temperature & environmental conditions (dust, ammonia, air quality)
  - Lighting program (schedule, intensity and distribution)
  - Housing system & equipment (should be same as laying house)
  - Good vaccination program
  - Good gut health
  - Good feed
  - Good water quality
2. Need an excellent skeleton and bone structure development
3. Need a tight biosecurity program (ex. : false layer bronchitis in white birds)
  - Cleaning, disinfection, fumigation before day-old placement
  - If previous challenge, heat the barn at 100°F for 4 days before day-old placement
  - Cloaca PCR Delmarva test at 7 and 14 days of age



# Key elements for success in aviaries

- Pullets should be prepared to:
  - Fly and jump
  - Be able to perch at different levels
  - Seek for feed at different levels
  - Seek for water
- Birds walk freely in the system, which requires to:
  - Have good supervision
  - Think about planning and how to do it for training, vaccination, catching



If pullets raised in cages are moved in an aviary housing system, consequences can be expected:

- Floor eggs
- Training pullets once in the aviary can cause mortality and may affect performance

# Lighting program

The goal of the lighting program is to train the birds to come back in the cages for the night.

This training is critical for things to go well in the laying barn:

- Help limit the amount of floor eggs.
- Hens will already be in their cages in the morning ready to lay, eat and drink. They therefore won't have to search to satisfy their needs.

Begin training in aviary: day 1 – start with lighting program:

- Initially, the birds are started as in conventional cages.
- When designing the barn, make sure the building is completely dark – no influence of daylight.
  - It is an important aspect in the rearing and in the laying house.
- Implementing a light effect program "**sunrise and sunset**" is important in the principle of training of pullets.
  - Start at the chick placement / day-old



# Rearing = key for success

## 0 to 3.5 weeks

- Good protection for *Coccidiosis*
- 2 pieces of paper under the feeders
- Good start (temperature, feed, water, etc.)
- Birds are kept inside the cages as conventional
- Start with one row of cages, and split the pullets at 10 days in 2 rows of cages.

## 3.5 to 8 weeks

- Start to train the pullets (freeing one cage out of 3 or 4)
- Always bring back the pullets in their cages at night
- Last about 2 to 3 weeks (max 4 weeks)

## 10 weeks

- Open of the top floor
- The uniformity needs to be excellent (>90%)



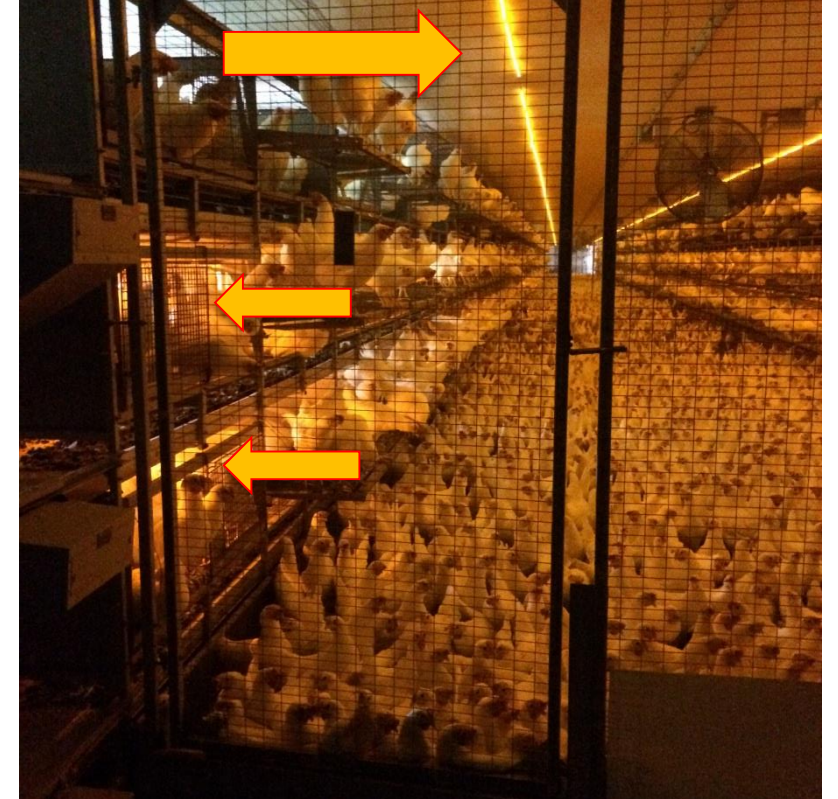


# Lighting program – Hellmann aviary system

Ceiling light

Light in the cages

Light under the system  
(floor)



# Protection with vaccination program

Age	Application method	Vaccines / medication	Supplier
Day old - hatchery	Subcutaneous	* Innovax-LT	Merck
	Subcutaneous	* Marek - Rispens	Merck
	Spray	* Bronchitis - Ma5	Merck
	Spray	* Immucox 5	Ceva
	Spray	* Poulvac E. Coli	Zoetis
14 days	Water	* Nclb1 Bron Mass Conn	<i>Merial</i>
	Water	* Univax Plus	<i>Merck</i>
(if cocci challenge)	Water	Amprolium	
4 weeks	Water	* Bursine II	<i>Zoetis</i>
6 weeks	Water	* <i>COMBOVAC-30</i>	<i>Merck</i>
10 weeks	Water	* <i>AVIPRO ND-IB SOHOL</i>	<i>Elanco</i>
	Water	* POULVAC E. COLI	<i>Zoetis</i>
14 weeks	Wing-web stab	* <i>TREMVAC®-FP</i>	<i>Merck</i>
	Subcutaneous	* <i>AVIPRO™ 201 ND-IB</i>	<i>L.A.H.I.</i>

# Feeding program – replacement pullets – White vs brown

- When calculating the quantities of feed to manufacture/deliver, always take into account the extra chicks from the hatchery
- Adjust to the diet program based on the weight of the pullets

	Phase, Weeks	Feed texture	Target body weight (g) White egg layers	Target body weight (g) Brown egg layers
20% Starter	0 to 5	Fine crumbles	344	372
18% Grower	5 to 10	Large crumbles	850	885
15% Developer	11 to 15	Mash	1,177	1,305
18% Pre-Lay	16	Mash	1,236	1,378
Pre-Peak (rearing)	17 to 18	Mash	1,345	1,519
Pre-Peak (laying)	19 to 24/25			

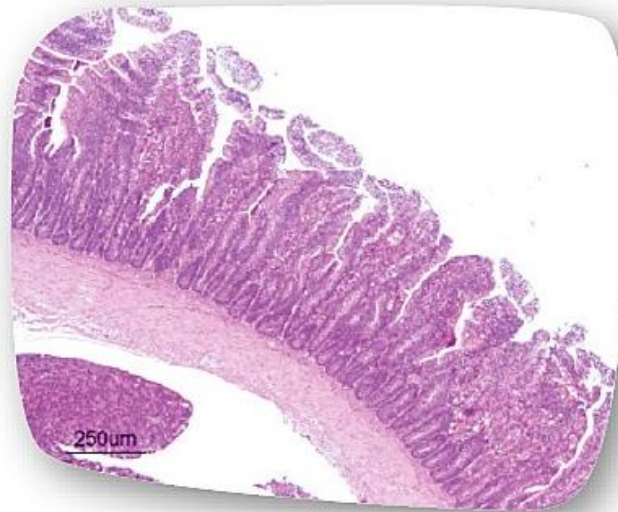
In summer season, plan to use some diets for longer periods:

Starter      0 to 5 weeks      -> 0 to 6 or 7 weeks  
 Grower      7 to 11 weeks      -> 7 to 11 or 12 weeks

# What is “Good” gut health?

- Efficient absorption of water and nutrients:
  - Villi length and crypt depth
  - Tight junctions

Source: eimeriaprevention.com



- Consistency in contents:
  - Not watery/gassy etc.
  - Absence of undigested feed particles in faeces
- What bacteria do we want there?
  - Natural shift in bacterial populations as birds mature
  - Wrong combination of bacteria?
    - *Dysbacteriosis*

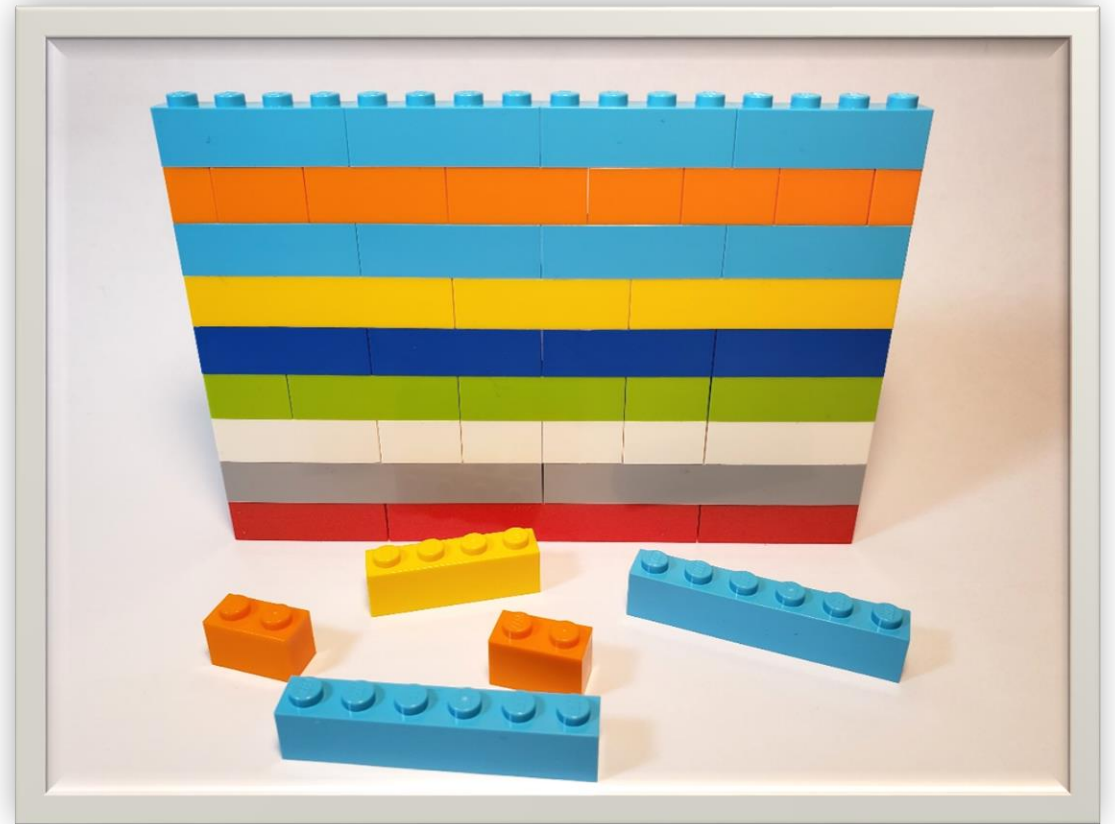
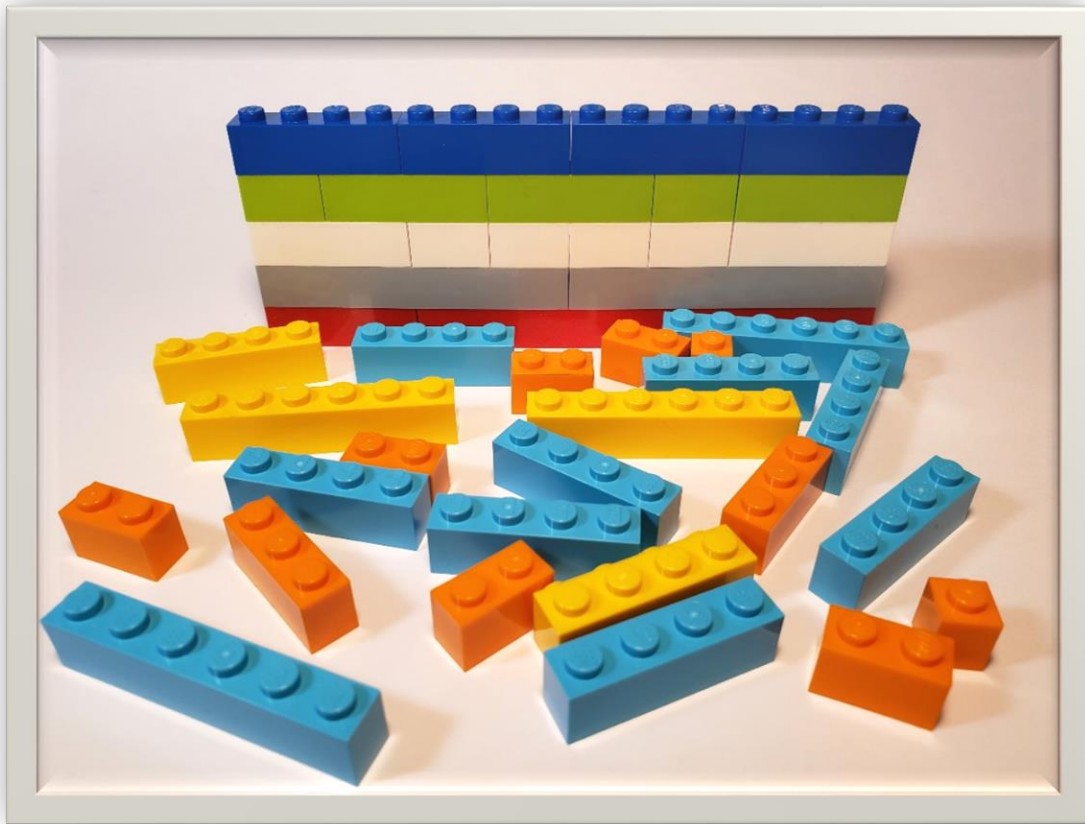
# Why is it a problem?

- Damaged intestines don't absorb nutrients:
  - Energy
  - Proteins
  - Minerals
  - Vitamins – immune system feedback
- Productivity is decreased

# What are the challenges to good gut health?

- Health issues, for instance:
  - Necrotic enteritis
  - Coccidiosis
  - Heat stress
  - Viral diseases
  - Anti-oxidant “status”
  - Unbalanced bacterial growth
    - APEC (*E. coli*)

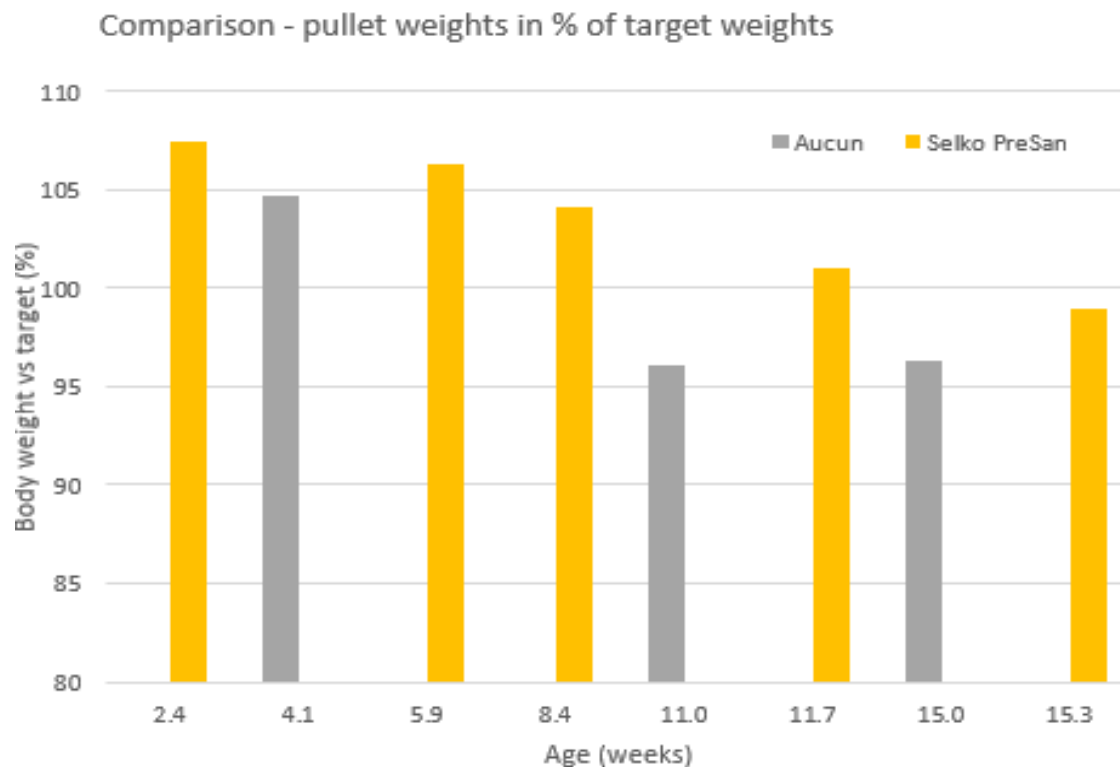
# Important – Build a good barrier!



# Rearing = key for success

Good gut health:

- Smooth changes in diet composition from load to load, or from starter to grower to developer to prelay to pre-peak feeds
- use of Presan in feed from day-old





# Pullet rearing

- Pullet uniformity is crucial. Weigh birds every week or every 2 weeks.
- Make sure body weights are over target (+5%) at 4, 6, 8, 10, 12, 18 weeks.
- Aim for >90% uniformity in different sections of the barn.
- Always weigh the pullets at least the week before a feed change. Take action if birds are not on target, or not uniform.

BAT 1 Manual Poultry Scale



Scale : FERME_AUISTAR...		
Print : 12/24/18 15:57		
TOTAL AUI A ALLEE	TOTAL AUI A RETOUR	
From : 12/24/18 15:28	From : 12/24/18 15:20	
To : 12/24/18 15:31	To : 12/24/18 15:28	
Count : 20	Count : 20	
Average : 1.585 kg	Average : 1.650 kg	
St.Dev. : 0.135 kg	St.Dev. : 0.109 kg	
CU : 8.5 %	CU : 6.6 %	
Uniformity : 95.0 %	Uniformity : 95.0 %	
Weight [kg]	Weight [kg]	Count
0.840	0.880	0
0.880	0.920	0
0.920	0.960	0
0.960	1.000	0
1.000	1.040	0
1.040	1.080	0
1.080	1.120	0
1.120	1.160	0
1.160	1.200	0
1.200	1.240	0
1.240	1.280	0
1.280	1.320	0
1.320 *****	1.360	0
1.360	1.400	0
1.400	1.440 *****	1
1.440 *****	1.480 *****	1
1.480 *****	1.520	0
1.520	1.560 *****	3
1.560 *****	1.600 *****	3
1.600 *****	1.640 *****	4
1.640 *****	1.680 *****	2
1.680	1.720 *****	3
1.720 *****	1.760	0
1.760	1.800 *****	1
1.800 *****	1.840 *****	1
1.840 *****	1.880	0
1.880	1.920 *****	1
1.920	1.960	0
1.960	2.000	0
2.000	2.040	0
2.040	2.080	0
2.080	2.120	0
2.120	2.160	0
2.160	2.200	0
2.200	2.240	0
2.240	2.280	0
2.280	2.320	0
2.320	2.360	0
2.360	2.400	0

# Examples

6 semaines

2019-03-22 11:52:52

Date et heure	Fichier	Nombre	Moyenne	Ecart St.	CV	Uniformité	Vitesse	Histogramme
2018-12-03 09:58	FAN	30	0,902	0,042	4,6	100,0	179	
2018-12-03 10:10	MILIEU FAN	25	0,894	0,047	5,3	100,0	199	
2018-12-03 10:19	MILIEU TRAPPE	25	0,907	0,052	5,8	100,0	184	
2018-12-03 10:30	TRAPPE	25	0,899	0,041	4,5	100,0	235	
TOTAL (4)		105	0,900	0,045	5,0	100,0	199	

12 semaines 1 jours

2019-03-22 11:47:00

Date et heure	Fichier	Nombre	Moyenne	Ecart St.	CV	Uniformité	Vitesse	Histogramme
2019-01-15 10:10	TRAPPE	10	0,992	0,020	2,0	100,0	69	
2019-01-15 10:25	MILIEU TRAPPE	20	0,979	0,027	2,8	100,0	141	
2019-01-15 10:36	MILIEU FAN	20	0,986	0,027	2,7	100,0	157	
2019-01-15 10:45	FAN	20	0,984	0,026	2,7	100,0	115	
TOTAL (4)		70	0,984	0,026	2,6	100,0	121	

17 sem 2 jours

2019-03-22 11:46:05

Date et heure	Fichier	Nombre	Moyenne	Ecart St.	CV	Uniformité	Vitesse	Histogramme
2019-02-20 10:17	FAN	14	1,271	0,038	3,0	100,0	109	
2019-02-20 10:26	MILIEU FAN	18	1,256	0,046	3,7	100,0	139	
2019-02-20 10:35	MILIEU TRAPPE	18	1,258	0,056	4,4	100,0	152	
2019-02-20 10:44	TRAPPE	9	1,266	0,039	3,1	100,0	130	
TOTAL (4)		59	1,262	0,046	3,6	100,0	133	

# Aviary rearing – water

- Have access to water (amount & quality)
- Some farmers also train the birds to find water lines for white pullets
- The goal is to teach chickens to look for water
- Around the age of 8 weeks:
  - Close a water line in the system for a day
  - The next day, open the line that was closed and close another one
    - This forces the pullets to find other water lines and move more efficiently in the system

**\*\*\* Be careful with brown hens because they will tend to wait next to the closed line instead of looking for water in other water lines.**

# Rearing – key points to remember

- For all types of rearing systems:
  - Monitoring bodyweight and controlling bird uniformity are critical for a successful egg production with good egg size.
- For floor and aviary rearing, training the birds is also very important for the future laying phase.
- Move the birds from rearing to production before 18 weeks for white layers, 17 weeks for brown layers :
  - To avoid to have eggs laid in rearing barn
  - Smooth transition with same pre-peak feed

**Rearing = key  
for success**





# Key elements for success in aviary

1. Good management procedures, including:
  - Monitoring body weight & uniformity
  - Egg production
  - Egg weight/size
  - Daily feed intake (key element to choose the right diet)
  - Daily water intake
  - Weekly bird body weight:
    - If birds gain too much weight – lower energy in the feed
    - If they don't gain weight, increase energy in the feed
2. Ventilation (air quality, dust, ammonia, litter quality) – Heat exchanger!





- Tunnel ventilation (summer season)
- Heat exchanger (4 seasons)
- 2 x 40,000 BTU Heating systems in front of air-inlets and heat exchanger to avoid water freezing!





# Transition to laying phase

## Nests & floor eggs

- Check nests (number, darkness, cleanliness, opening/closing system)
- Gather floor eggs after transfer in the laying house (8 to 9 times per day), and the eggs in the system. Make birds move in the system.
- Nests open at 4:00 and close at 17:30 for aviary, but close at 16:00 for organic (labor availability issues)
- When 2 flocks in the barn, egg collectors run:
  - 7:00 to 8:00
  - and 9:00 to 10:00 for older flockand
  - 8:00 to 9:00 and
  - 10:00 to 11:00 for younger flock



# Transition to laying phase – Feed



- Use of the same pre-peak feed as in rearing barn, up to 24/25 weeks of age to feed intake
- Use of Presan in the feed at 0.4 to 0.5 kg/t
- Make sure good feed distribution & uniform feed texture
  - 1,600 microns particle size for mash feed
- Feeders run:
  - From 7:00 am
  - Then every 2 hours
  - And the last meal 2 hours before lights turn off



# Observations in laying period



- Feed intake: could be quite high if no heating system in the barn (ref. winter season)
- If feed intake is low (about 100-102 g/b/d), increase the feed density (more energy + more amino acids + more minerals, more vitamins).
- Maintenance requirements of birds are higher in aviary (birds move and fly) by about +5 to 10% vs conventional cages

Feed intake, g/h/d	100	105	110	115
296 kcal/b/d	2,960 kcal/kg	2,819 kcal/kg	2,691 kcal/kg	2,609 kcal/kg
311 kcal/g/d (+5%)	3,110 kcal/kg	2,962 kcal/kg	2,827 kcal/kg	2,704 kcal/kg

# Transition to laying phase – Light

- Check light schedule vs rearing, intensity and distribution in the barn
- Lights turn off at same time as in pullet rearing house
- Lights:
  - Turn on at 6:00 a.m. (with gradual increase in intensity as sunrise) and
  - Turn off at 8:00 p.m. (with gradual decrease as sunset)
  - Starting from the lights at floor level, then ceiling, and finally in the system



# Transition to laying phase

## Nests & floor eggs

- Lower grids (floor level):
  - Open at 10:00 a.m. (when floor eggs are under control)
  - Close at midnight (to avoid bird caught in the system)
  - Manure cleaning with scraper around 8:00 a.m. to 9:30 a.m. when birds are used to lay in nests
- Make sure birds get into the system at night
- Problems are more visible and could be amplified!



### Feuille de suivi - LOHMANN LSL-LITE

DATE ENTRÉE: 26 Octobre 2020		NOM: AUIA		#POULES: 46895		#POULAILLER:										
DATE	ÂGE (sem.)	# poules mortes	# poules restantes	VIAB. % obj	VIAB. % réel	PRODUCTION			POIDS CIBLE				MASSE D'OEUF			
						Poules en poulailler % cible	#oeufs pondus totaux/sem	# oeufs cumulés totaux	ONTE % réel	Oeufs /P.E. réel	POULES g Standard	oeuf g réel	CEUFS g réel	g/p/obj	g/p/ réel	
21/10/20	19	26	46743	100.0	99.9	10.0	10421	10421	3	1	0.2	1310	45	40.7	4556	4.1
10/11/20	20	60	46794	100.0	99.8	36.3	93712	104133	288	3	2.2	1370	154	43.9	44.6	15.9
11/11/20	21	61	46733	99.9	99.6	56.9	217517	322650	663	7	6.1	1420	158	46.7	47.4	26.6
23/11/20	22	31	46702	99.9	99.6	72.5	244592	567242	75	12	12.1	1465	163	49.2	49.7	35.7
30/11/20	23	32	46685	99.8	99.5	83.0	310487	877729	95	18	13.7	1505	165	51.4	52.1	42.7
7/12/20	24	20	46665	99.8	99.5	89.2	316620	1194249	97	24	25.5	1540	163	53.3	54.2	47.5
14/12/20	25	13	46648	99.7	99.5	92.5	318246	1512595	97.5	31	32.3	1570	173	54.8	55.3	50.7
21/12/20	26	22	46628	99.7	99.4	94.1	319211	1831736	97.8	37	32.1	1595	173	56.0	56.2	52.7
28/12/20	27	19	46609	99.6	99.4	94.8	319785	2151621	98	44	45.9	1615	171	56.9	57.8	53.9
04/01/21	28	18	46592	99.6	99.4	95.3	320072	2471693	98.1	51	52.7	1625	174	57.6	58.4	54.9
11/01/21	29	16	46576	99.5	99.3	95.7	320476	2792169	98.3	57	59.5	1630	171	58.2	58.9	55.7
18/01/21	30	11	46565	99.4	99.3	96.1	320177	3112346	98.2	64	66.4	1632	171	58.7	59.1	56.4
25/01/21	31	16	46549	99.3	99.3	96.3	320194	3432540	98.2	71	73.2	1634	172	59.2	59.8	57.0
02/02/21	32	8	46541	99.2	99.2	96.5	320472	3753012	98.4	77	80	1636	173	59.6	60.1	57.5
09/02/21	33	11	46530	99.1	99.2	96.5	320076	4073098	98.3	84	86.8	1638	174	60.0	60.8	57.9
16/02/21	34	10	46520	99.0	99.2	96.5	320278	4393396	98.4	91	93.4	1640	174	60.3	60.1	58.2
23/02/21	35	7	46513	98.9	99.2	96.5	319991	4713387	98.3	97	102.5	1642	177	60.4	60.3	58.5
01/03/21	36	10	46503	98.8	99.2	96.4	319597	5032988	98.2	104	107.3	1644	177	60.1	61.4	58.7
08/03/21	37	15	46488	98.7	99.1	96.4	319399	5352883	98.3	111	114.1	1646	175	61.1	61.6	58.9
15/03/21	38	15	46473	98.6	99.1	96.3	319416	5672027	98.1	117	121	1648	173	61.1	61.1	59.0
22/03/21	39	13	46460	98.5	99.1	96.3	319463	5991492	98.2	124	127.7	1650	170	61.1	60.7	59.1
29/03/21	40	12	46448	98.4	99	96.2	320154	6311612	98.2	130	135	1652	170	61.1	60.8	59.2
05/04/21	41	14	46434	98.3	99	96.1	319799	6631448	98.1	137	141.4	1654	170	61.1	60.5	59.2
12/04/21	42	12	46412	98.2	99	96.0	318740	6950185	98	144	148.2	1656	170	61.1	60.8	59.2
19/04/21	43	12	46412	98.1	98.9	95.9	318981	7268981	98.1	150	155	1657	170	61.1	61.8	59.3
26/04/21	44	4	46405	98.0	98.9	95.8	318246	7587177	98	157	161.7	1658	170	61.1	61.8	59.3
03/05/21	45	9	46399	97.9	98.9	95.7	318197	7905375	98	163	168.5	1659	170	62.1	61.8	59.3
10/05/21	46	11	46389	97.8	98.9	95.5	317739	8223114	97.9	170	175.3	1660	170	62.1	61.8	59.3
17/05/21	47	11	46379	97.7	98.9	95.4	317510	8540624	97.8	176	182.1	1661	170	62.1	61.8	59.3
24/05/21	48	9	46362	97.6	98.9	95.2	316560	8857185	97.5	183	188.9	1662	170	62.1	61.8	59.3
31/05/21	49			97.5		95.0				189		1663		62.1		59.3
	50			97.4		94.7				196		1664		62.1		59.2

Print : 05/26/21 15:05

TOTAL AUIA BAS  
From : 05/26/21 13:50  
To : 05/26/21 13:54

Count : 23  
Average : 1.817 kg  
St.Dev. : 0.082 kg  
CU : 4.5 %  
Uniformity : 100.0 %

Weight [kg]	Count
1.040	0
1.080	0
1.120	0
1.160	0
1.200	0
1.240	0
1.280	0
1.320	0
1.360	0
1.400	0
1.440	0
1.480	0
1.520	0
1.560	0
1.600	0
1.640 ***	1
1.680 ***	1
1.720 *****	2
1.760 *****	6
1.800 *****	2
1.840 *****	3
1.880 ***	1
1.920 *****	7
1.960	0
2.000	0
2.040	0
2.080	0
2.120	0
2.160	0
2.200	0
2.240	0
2.280	0
2.320	0
2.360	0
2.400	0
2.440	0
2.480	0
2.520	0
2.560	0

Scale : FERME AJUSTAR  
Print : 05/26/21 15:06

TOTAL AUIA HAUT  
From : 05/26/21 13:43  
To : 05/26/21 13:48

Count : 23  
Average : 1.819 kg  
St.Dev. : 0.113 kg  
CU : 6.2 %  
Uniformity : 100.0 %

Weight [kg]	Count
1.040	0
1.080	0
1.120	0
1.160	0
1.200	0
1.240	0
1.280	0
1.320	0
1.360	0
1.400	0
1.440	0
1.480	0
1.520	0
1.560	0
1.600	0
1.640 *****	2
1.680 ****	1
1.720 *****	4
1.760 *****	4
1.800 *****	2
1.840 ****	1
1.880 *****	5
1.920	0
1.960 ****	1
2.000 ****	1
2.040	0
2.080 *****	2
2.120	0
2.160	0
2.200	0
2.240	0
2.280	0
2.320	0
2.360	0
2.400	0
2.440	0
2.480	0
2.520	0
2.560	0



### Feuille de suivi - H&N Nick Chick

DATE ENTRÉE: 15 AVRIL 2021		NOM: ST-OURS AVIC		PRODUCTION											
DATE	ÂGE (sem.)	# poules restantes	VIAB. %	VIAB. % réel	Poules en poulaille %	PONTE % réel	# oeufs semaine	# oeufs cumulés	Oeufs /poule entrée	Oeufs /poule réel	POULES			OEUFs	
											g min	lbs min	réel	g	réel g/p
19/04/21	19	41863	100,0	100	0	6.6	11 117	11 117	0,6	27	1356	2,99	1,51	42,3	41,8
26/04/21	20	41855	99,9	99,9	4,0	33.5	109 239	109 239	3,0	26	1406	3,10	1,61	45,4	45,1
3/05/21	21	41849	99,8	99,9	55,0	71	208 667	317 901	6,8	76	1451	3,20	1,61	47,7	49
10/05/21	22	41837	99,7	99,8	71,2	90,4	271 739	382 610	11,8	139	1487	3,23	1,62	49,8	50,6
17/05/21	23	41826	99,6	99,8	82,4	96,3	381 958	464 548	17,6	206	1514	3,34	1,63	51,7	51,2
24/05/21	24	41821	99,5	99,8	88,8	98,1	471 197	515 745	23,7	235	1542	3,40	1,63	53,2	52,5
	25		99,4		91,7				30,1		1560	3,40		54,3	
	26		99,3		93,1				36,6		1573	3,40		55,5	
	27		99,2		94,0				43,1		1582	3,49		56,5	
	28		99,1		94,7				49,7		1592	3,51		57,2	
	29		99,0		95,0				56,3		1592	3,51		57,6	
	30		98,9		95,4				62,9		1596	3,52		58,1	
	31		98,8		95,7				69,5		1601	3,53		58,6	
	32		98,7		95,8				76,1		1601	3,53		59,1	
	33		98,6		95,9				82,7		1605	3,54		59,3	
	34		98,5		96,0				89,4		1610	3,55		59,8	
	35		98,4		96,1				96,0		1610	3,55		60,0	
	36		98,3		96,1				102,6		1614	3,56		60,0	
	37		98,2		96,1				109,2		1619	3,57		60,2	
	38		98,1		96,1				115,8		1619	3,57		60,5	
	39		98,0		96,1				122,4		1623	3,58		60,7	
	40		97,9		96,1				129,0		1623	3,58		60,7	
	41		97,8		96,1				135,6		1628	3,59		61,0	
	42		97,7		96,1				142,1		1628	3,59		61,2	
	43		97,6		96,0				148,7		1632	3,60		61,2	
	44		97,5		96,0				155,2		1632	3,60		61,4	
	45		97,4		95,9				161,8		1637	3,61		61,7	
	46		97,3		95,9				168,3		1637	3,61		61,7	

Scale : FERME\_AVISTAR\_\_  
Print : 05/26/21 15:05

TOTAL AVIC HAUT  
From : 05/26/21 14:47  
To : 05/26/21 14:51

Count : 24  
Average : 1.592 kg  
St.Dev : 0.102 kg  
CV : 6.4 %  
Uniformity : 95.8 %

Weight [kg] Count  
0 0  
0,840 0  
0,880 0  
0,920 0  
0,960 0  
1,000 0  
1,040 0  
1,080 0  
1,120 0  
1,160 0  
1,200 0  
1,240 0  
1,280 0  
1,320 0  
1,360 0  
1,400 0  
1,440 0  
1,480 0  
1,520 0  
1,560 0  
1,600 0  
1,640 0  
1,680 0  
1,720 0  
1,760 0  
1,800 0  
1,840 0  
1,880 0  
1,920 0  
1,960 0  
2,000 0  
2,040 0  
2,080 0  
2,120 0  
2,160 0  
2,200 0  
2,240 0  
2,280 0  
2,320 0  
2,360 0

Scale : FERME\_AVISTAR\_\_  
Print : 05/26/21 15:06

TOTAL AVIC BAS  
From : 05/26/21 14:53  
To : 05/26/21 14:58

Count : 22  
Average : 1.665 kg  
St.Dev : 0.088 kg  
CV : 5.2 %  
Uniformity : 100.0 %

Weight [kg] Count  
0 0  
0,920 0  
0,960 0  
1,000 0  
1,040 0  
1,080 0  
1,120 0  
1,160 0  
1,200 0  
1,240 0  
1,280 0  
1,320 0  
1,360 0  
1,400 0  
1,440 0  
1,480 0  
1,520 \*\*\*\* 1  
1,560 \*\*\*\* 3  
1,600 \*\*\*\* 2  
1,640 \*\*\*\* 5  
1,680 \*\*\*\* 5  
1,720 \*\*\*\* 3  
1,760 \*\*\*\* 1  
1,800 \*\*\*\* 1  
1,840 \*\*\*\* 1  
1,880 \*\*\*\* 1  
1,920 \*\*\*\* 0  
1,960 \*\*\*\* 0  
2,000 \*\*\*\* 0  
2,040 \*\*\*\* 0  
2,080 \*\*\*\* 0  
2,120 \*\*\*\* 0  
2,160 \*\*\*\* 0  
2,200 \*\*\*\* 0  
2,240 \*\*\*\* 0  
2,280 \*\*\*\* 0  
2,320 \*\*\*\* 0  
2,360 \*\*\*\* 0  
2,400 \*\*\*\* 0  
2,440 \*\*\*\* 0

# Daily monitoring

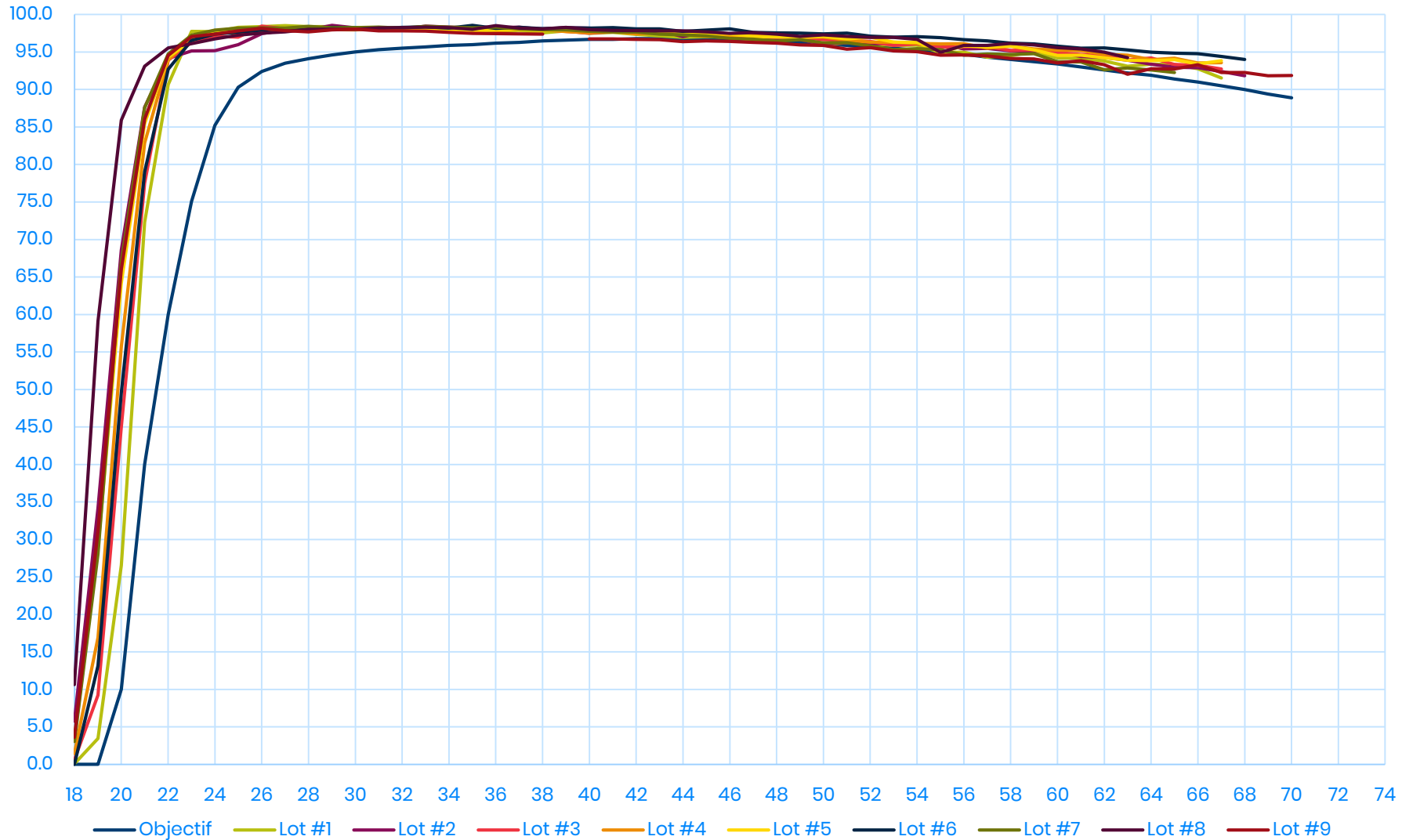
- Temperature & humidity (egg room) – min. & max
- Temperature (in the barn) – min. & max
- Mortality & selection (culled)
- Water intake
- Feed intake

Age des poules	Jour	Heure	Temp. Ch. Fr.			IR-Temp. Pondeir		Sélection naturelle	Euthanasie	Consommation d'eau	Consommation de moules
			Minimum	Maximum	Humidité	Minimum	Maximum				
	1	7:00	89	11.8	88	23.3	24.7	1	0	3262	96gr
✓	2	7:00	88	12.5	91	23.1	24.7	2	0	3327	100gr
	3	7:00	7.7	12.2	88	23.2	24.7	0	0	3239	100gr
	4	7:00	8.4	13.1	84	23.2	24.6	0	0	3244	99gr
	5	7:00	88	12.2	90	23.1	24.6	3	0	3288	99gr
	6	7:00	89	9.2	88	23.2	24.6	2	0	3328	100gr
34	7	7:00	90	11.2	80	23.2	24.6	2	0	3322	102gr
	8	7:00	88	11.8	84	23.1	24.6	2	0	3280	100gr
✓	9	7:00	88	11.8	81	23.1	24.6	3	0	3384	99gr
	10	7:00	2.4	11.3	68	23.1	24.6	4	0	3302	100gr
	11	7:00	8.6	11.5	72	23.2	24.6	2	0	3303	99gr
35	12	7:00	9.4	11.2	82	23.1	24.6	2	0	3312	99gr
	13	7:00	9.1	11.2	77	20.9	24.2	1	0	3299	99gr
	14	7:00	7.3	10.7	81	23.2	24.6	2	0	3320	103gr
	15	7:00	86	11.5	78	23.1	24.6	1	0	3095	99gr
✓	16	7:00	8.7	11.1	73	21.1	23.8	0	0	3417	97gr
	17	7:00	0.3	10.5	61	22.8	23.8	2	0	3371	96gr
	18	7:00	6.8	10.9	72	23.2	23.8	1	0	3302	103gr
36	19	7:00	8.7	11.4	76	23.2	23.9	4	0	3290	107gr
	20	7:00	8.7	11.4	77	22.9	23.8	4	0	3341	104gr
	21	7:00	6.0	11.8	67	23.1	23.9	0	0	3367	102gr
	22	7:00	8.4	13.1	78	22.9	24.6	4	0	3359	102gr
✓	23	7:00	8.8	11.9		23.1	24.6	0	0	3311	103gr
	24	7:00	6.9	11.8	78	23.1	24.6	1	0	3290	102gr
	25	7:00	8.3	11.4	79	23.0	24.6	2	0	3258	99gr
37	26	7:00	9.0	11.0	72	23.0	24.0	2	0	3329	102gr
	27	7:00	8.9	11.6	79	23.2	24.5	0	0	3316	102gr
	28	7:00	6.6	12.1	77	23.1	24.6	2	0	3344	98gr
	29	7:00	8.5	12.3	78	23.2	24.3	2	0	3297	100gr
✓	30	7:00	8.9	11.0	88	23.3	24.4	3	0	3297	104gr
	31	7:00	1.2	11.1	76	23.1	24.2	1	0	3222	100gr



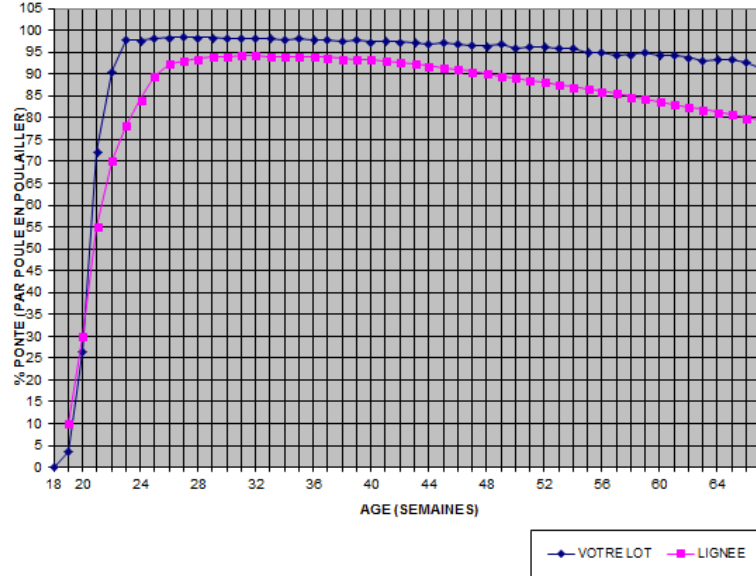
# Egg production curves – White egg layers in aviary

White Egg layers production - Aviary - 2016 to 2021



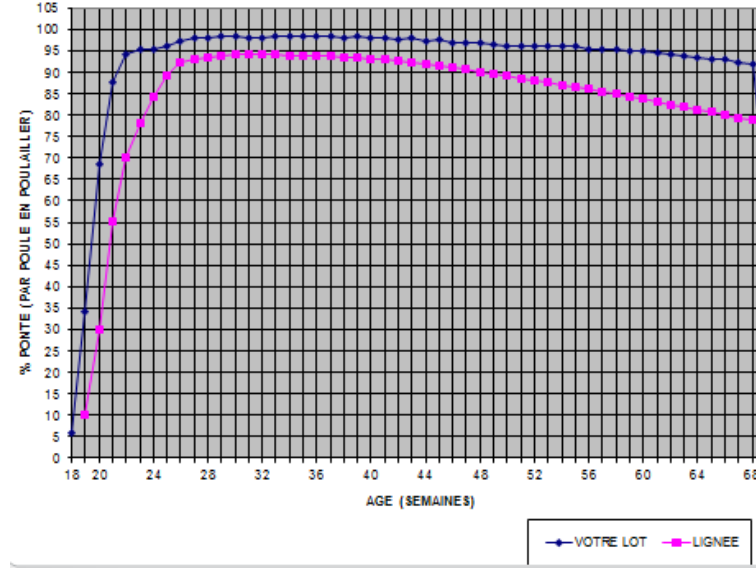
# Flock #1 – Aug 2016 to Aug 2017

COURBE DE PONTE OPTIOEUF



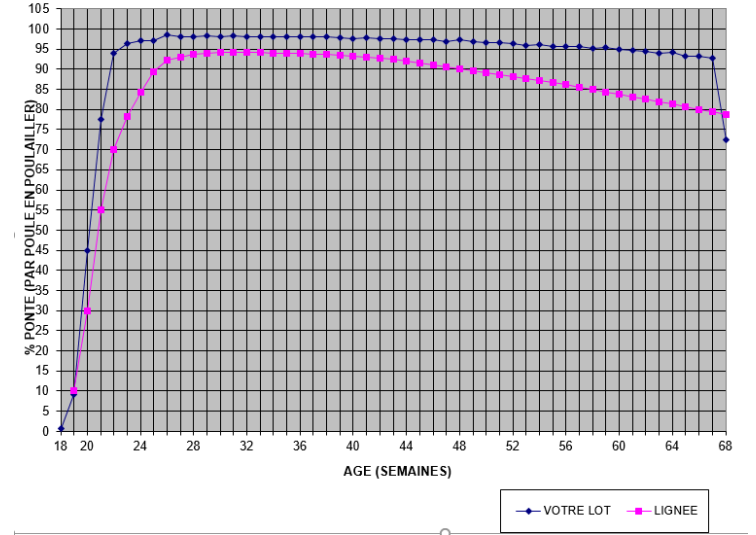
# Flock #2 – Feb 2017 to Feb 2018

COURBE DE PONTE OPTIOEUF



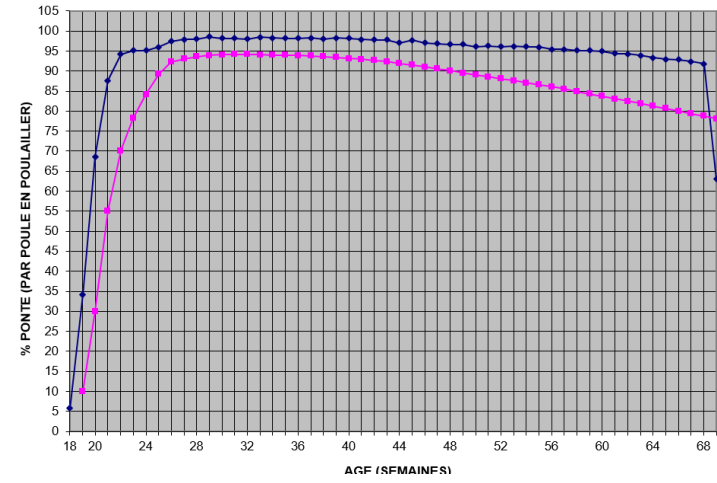
# Flock #3 – Aug 2017 to Aug 2018

COURBE DE PONTE OPTIOEUF



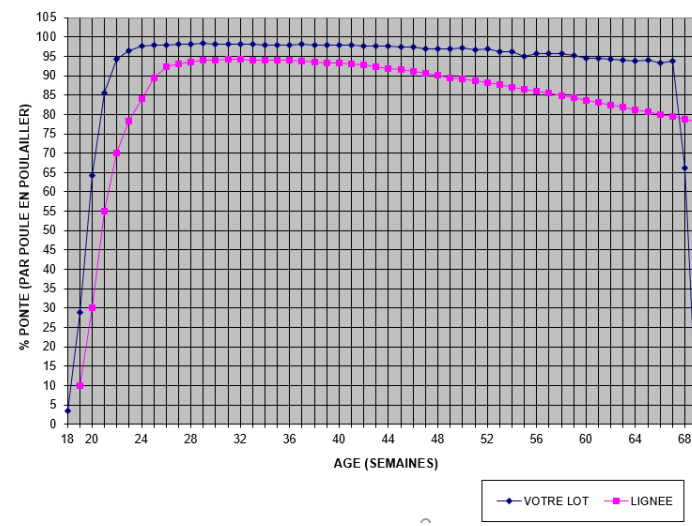
# Flock #4 – Feb 2017 to Feb 2018

COURBE DE PONTE OPTIOEUF



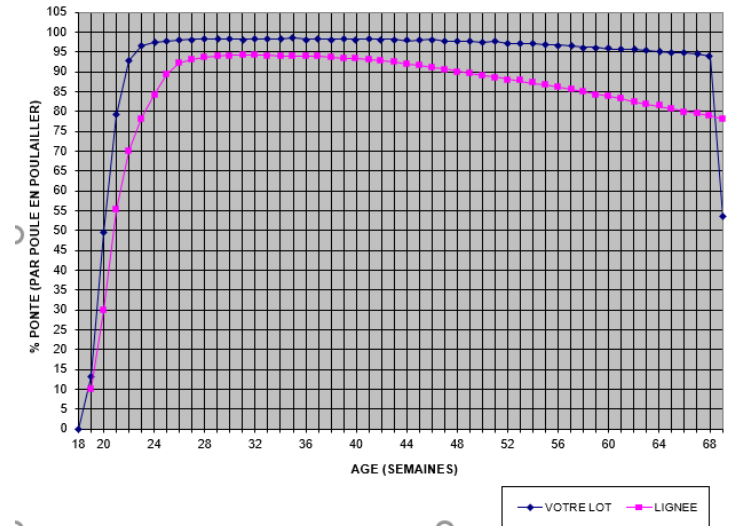
# Flock #5 – Aug 2018 to Aug 2019

COURBE DE PONTE OPTIOEUF



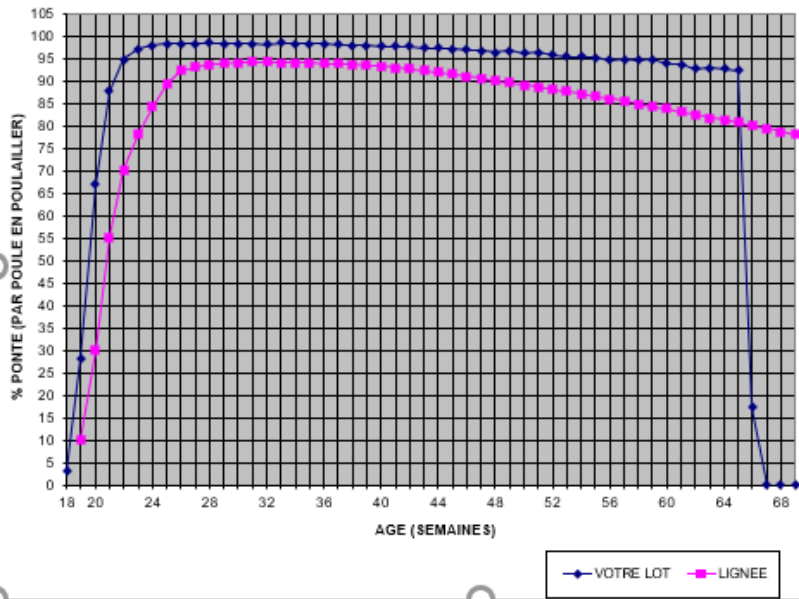
# Flock #6 – Feb 2019 to Feb 2020

COURBE DE PONTE OPTIOEUF



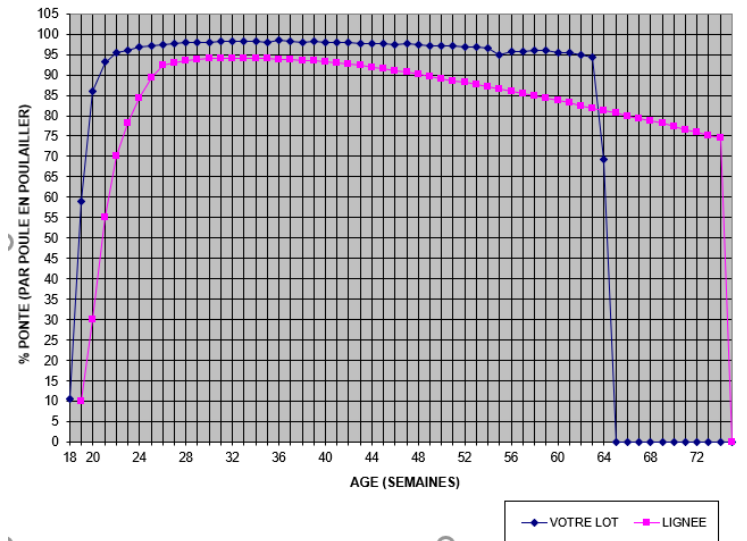
# Flock #7 – Aug 2019 to July 2020

COURBE DE PONTE OPTIOEUF



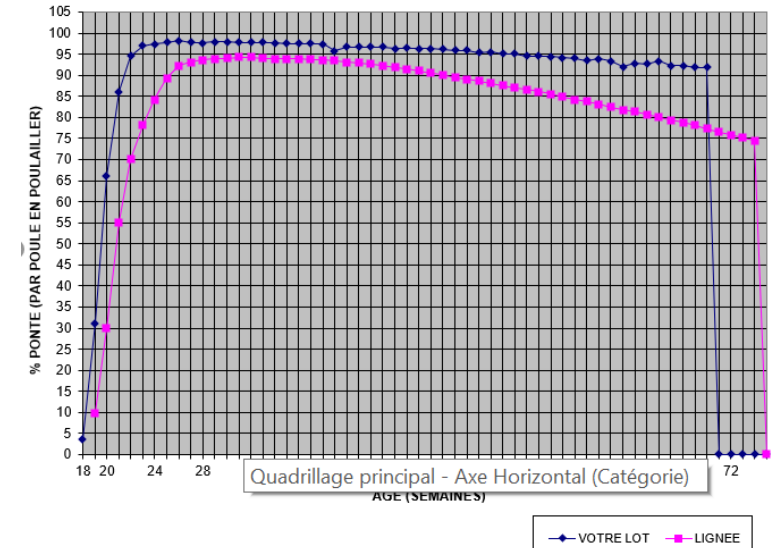
# Flock #8 – March 2020 to Jan 2021

COURBE DE PONTE OPTIOEUF



# New barn 50,000 birds Oct 2019 to Oct 2020

COURBE DE PONTE OPTIOEUF



# White egg layers – Aviary housing system – 2016 to 2021 – 9 flocks

Transfer date	2016-08-20	2017-02-24	2017-08-17	2018-03-02	2018-08-18	2019-02-28	2019-08-15	2020-03-01	2019-10-11	
Shipping date	2017-08-08	2018-02-20	2018-08-06	2019-02-18	2019-08-08	2020-02-18	2020-07-17	2021-01-22	2020-10-15	Average
							Early shipping	Early shipping	Fowl Pox	
#days in production	352	360	353	352	354	354	336	326	369	351
#wks in production	50.3	51.4	50.4	50.3	50.6	50.6	48.0	46.6	52.7	50.1
#hens housed	19 997	16 630	20 109	20 260	20 150	18 830	19 850	20 034	50 671	22 948
#hens shipped	19 330	15 802	19 624	19 460	19 672	18 620	19 757	19 488	50 299	22 450
%mortality	3.34	4.98	2.41	3.95	2.37	1.12	0.86	2.73	1.32	2.56
# eggs/hen housed	315	328	321	320	325	330	310	306	339	322
# dozens/hen housed	26.3	27.3	26.8	26.7	27.1	27.5	25.8	25.5	28.3	26.8
# weeks >98% egg prod	10	12	10	5	9	18	13	12	2	10.1
Average egg weight, g	58.4	59.5	59.1	59.6	59.2	59.5	59.5	60.4	61.2	59.6
Feed intake, g/h/d	98.3	108.2	103.1	101.2	100.9	101.3	101.0	101.2	100.4	101.7
FCR kg/dozen	1.302	1.400	1.344	1.318	1.308	1.297	1.311	1.286	1.306	1.319
FCR kg/kg egg	1.856	1.962	1.896	1.843	1.840	1.817	1.838	1.773	1.777	1.845
% Large & Xlarge	68.6	68.7	73.1	74.6	74.4	75.4	76.0	78.9	75.0	73.9
% Medium	25.5	19.2	21.0	19.2	19.1	18.6	18.9	19.7	12.9	19.3
% Downgrades	2.2	2.4	1.8	2.1	2.0	1.7	0.9	0.5	1.3	1.7

# Organic production – Brown egg layers – Floor/slats & outdoor 2017 to 2021 (41 flocks)

Transfer date			
#days in production	353	Feed intake, g/h/d	117.6
#wks in production	50.5	Feed intake, kg/b	41.5
#hens housed/flock	5067	FCR kg/dozen	1.588
#hens shipped/flock	4657	FCR kg/kg egg	2.172
#hen average/flock	4847	% Large & Xlarge	80.8
%mortality	8.09	% Medium	14.7
# eggs/hen housed	306.1	% Downgrades	2.0
# dozens/hen housed	25.5	# weeks >98%	0.4
Average egg weight, g	60.9	# weeks >97%	1.5
Average egg mass, g/b/d	52.8	# weeks >96%	5.9
		# weeks >95%	12.6

# From rearing to laying phase in aviary

## Keys for success:

- Train the birds
- Collect eggs on floors and in the system
- Use same system in rearing (or very similar equipment)
- Keep litter very dry
- Have enough nest space
- Only one row of nests with egg collector (very few downgraded eggs)
- Very good air quality (no dust, no ammonia) – good for birds and employees
- Good vaccination program to protect birds
- Good biosecurity program
- Good water quality



# Observed mortality causes in aviary

- Manure scraper (broken legs, injuries)
- Adjustment of the fence under the system (birds get caught)
- Adjustment of nest equipment (birds get caught)
- *Colibacillosis* in peak phase, after heat stress challenge (more frequent than previous years)
- Poor understanding of ventilation system (poor litter quality, variation in barn temperature)
- Stress due to lighting system (bad connection of the tubes = flickering)
- Birds piling-up

# Observed problems in organic production (floor system with slats)

- Brown bird behavior: less agile, need ramps to get to the nests, don't fly as much as white birds, walk more, very difficult to change bad habits
- Dust, ammonia in winter
- Feather pecking/cannibalism – light intensity: structural fibers in feed is essential!
- Floor eggs (90% at 7:00 a.m. with brown birds vs 25% for white birds) = light control, bird training
- Egg weight/size too large with downgrades: monitor daily feed intake and avoid too much protein in feed
- *Colibacillosis*: vaccination program (day old and 10 weeks) + yeast cell walls + yucca in feed
- Worms: Diatomaceous earth in feeds
- Northern black mites: Diatomaceous earth or sunflower shells or inorganic sulfur around poles, walls, sandy bath
- Black beetles: biological predators – Larvanem/Terranem (nematodes)
- Flies: biological predators – Bugs for Bugs/Kunafin bugs (wasps)

Note: Presan not authorized in organic feeds in Canada!



# Conclusion





**Thank you**