



MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE
státní podnik, ÚSTRAŠICE

390 02 Tábor 2

Tel.: 381 200 320

Performance test of laying type of hens

**XXXXX
alternative system**

**The final report
(2023 – 2024)**

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1 The list of participants

Treatment	Genotype	Hatchery flock	State	Breeding organization
1	xxxxxx	xxxxxx	xxxxxx	xxxxxx
2	xxxxxx			
3	xxxxxx			
4	xxxxxx			
5	xxxxxx			
6	xxxxxx			
7	xxxxxx	xxxxxx	xxxxxx	
8	xxxxxx			

2 The basic data of performance test

2.1 Performance test

The performance test of final layer's hybrids consists of:

- hatching of delivered eggs
- rearing of pullets: 18 weeks long growing period (126 days)
- hen keeping: 28 weeks long laying period (127 – 322 days of age)

2.2 Location of the test

Mezinárodní testování drůbeže, s.p. Ústrašice – Testační stanice nosných slepic (Test Station of Layers)

2.3 Material

There were compared 8 treatments in the trial. Each treatment consisted of 720 hatching eggs delivered to the test station.

2.4 Test term

setting in the hatchery:	28 August 2023
beginning of rearing – day 1:	19 September 2023
end of rearing:	23 January 2024
beginning of laying, beginning of the period 1:	24 January 2024
end of laying, end of the period 8:	6 August 2024

3 Hatching

3.1 Sorting and weighing of hatching eggs

The hatching eggs were sorted immediately after delivery to the test station. The average egg weight of each treatment was taken.

3.2 Storage of hatching eggs

After sorting and weighing, the hatching eggs were disinfected and stored in temperature of 16 – 18 °C.

3.3 Setting in the hatchery

Hatching eggs of all treatments were set in the hatchery at a time. Correspondent evidence was made during the hatching period.

4 Rearing of pullets

4.1 Treatments

The rearing of pullets took 126 days. Day old chicks were sexed. Cocks were destroyed. 200 pullets of the 1st, 4th, 5th, 7th and 8th samples, 280 pullets of the 2nd sample, 165 pullets of the 3rd sample and 110 pullets of the 6th sample were randomly chosen after retirement of inconvenient birds.

4.2 Housing system

Pullets were kept in windowless house with full climatic control, on deep litter. Manually filled tube feeders and nipple automatic drinkers were used.

4.3 Environment conditions

Temperature

Age	Below the heater °C	In the house °C
Day 1 - 3	36	27
Day 4 - 7	33	27
Day 8 - 14	30	24
Day 15 - 21	27	24
Day 22 - 28	24	22
Day 29 - 35	-	20
From week 6	-	18 – 20

Stocking density

Age	Stocking density
Day 1 – 112	9 birds/m ²
From day 113	7 birds/m ²

Ventilation

Transversal controlled ventilation (fans and air inlets on the opposite side) was used in the house. Automatic ventilation provided minimum ventilation rate 3 m³/hour/kg live weight in winter, with possibility of increasing in summer, in dependence on temperature and air humidity. Relative humidity was 50 – 70 %.

4.4 Lighting program

Pullets were kept in windowless house. Lighting program was controlled according to time setting:

Lighting program

Age	Hours of light	Luminous intensity (lx)
Day 1 - 3	23	40
Day 4 - 7	20	30
Day 8 - 14	18	20
Day 15 - 21	16	10
Day 22 - 28	14	10
Day 29 - 35	12	5-10
Week 6 - 16	10	5-10
Week 17	12	10-15
Week 18	13	10-15

4.5 Feeding and watering

Pullets were fed ad libitum during the rearing. The complete feed mixture was filled daily in tube feeders. Nipple automatic drinkers were used.

Feed was produced in xxxxx

Diet formulas

	K1 IT N	K2 IT N	KZK IT N	N0 IT N
Age	Week 1 - 4	Week 5 - 10	Week 11 - 16	Week 17 - 18
Feed form	crumbled	mash	mash	mash
Components – content in %:				
Wheat	51.00	52.78	58.49	51.26
Maize	15.00	16.00	10.00	15.00
Extr. soybean groats	23.85	19.30	9.00	16.35
Extr. rapeseed groats	1.50	2.00	3.00	3.00
Extr. sunflower groats	1.50	2.00	2.90	2.50
Wheat bran	-	2.50	12.20	2.30
Fish meal	1.50	0.70	-	-
Soybean oil	1.56	0.92	0.88	0.30
Animal fat	-	-	-	1.82
Lysine-HCl	0.29	0.22	0.20	0.13
L-threonine	0.07	0.03	-	-
DL-methionine	0.23	0.17	0.08	0.15
Sodium sulfate	0.15	0.13	0.12	0.17
Salt	0.26	0.27	0.27	0.24
Limestone	1.97	1.95	2.15	3.53
Limestone-roughly ground	-	-	-	2.00
MCP – monocalciumphosphate	0.85	0.75	0.42	0.80
Vitamin and mineral supplement	0.27	0.28	0.29	0.45
Nutrient content (calculated values):				
CP (g/kg)	203.10	186.00	155.90	169.10
Fat (g/kg)	36.00	29.60	28.30	40.00
Linoleic acid (g/kg)	16.00	13.00	12.50	11.00
Crude fiber (g/kg)	29.80	32.80	42.00	33.10
ME enz. (MJ/kg)	12.30	12.10	11.80	11.50
Lysine (g/kg)	11.41	9.75	7.28	8.26
Methionine (g/kg)	5.15	4.39	3.21	3.96
Met. + Cys. (g/kg)	8.67	7.77	6.31	7.13
Threonine (g/kg)	7.90	6.82	5.23	5.91
Tryptophan (g/kg)	2.42	2.21	1.88	2.02
Ca phytase (g/kg)	12.00	11.50	11.50	24.50
P (g/kg)	6.20	6.00	5.90	5.90
P digest. (g/kg)	4.80	4.50	3.80	4.40
Vitamin A (IU/kg)	10000.00	10000.00	10000.00	10000.00
Vitamin D3 (IU/kg)	3000.00	3000.00	3000.00	3000.00

4.6 Veterinary precautions

House was cleaned, washed and disinfected by xxxxx before the pullet placement. Disinfection of shoes by xxxx before entry was used. Rodent control was provided regularly.

Vaccination program

Age	Disease
Day 1	Marek's disease
	Infectious bronchitis
Day 3	Salmonellosis
Day 7	Coccidiosis
Day 10	E.coli
Day 13	Infectious bronchitis
Day 17	Newcastle disease
	Gumboro disease
Week 3	Salmonellosis
Week 4	Gumboro disease
Week 6	Infectious bronchitis
	Newcastle disease
Week 9	Infectious bronchitis
Week 10	Avian pneumovirus
Week 11	Avian encephalomyelitis
Week 12	Infectious bronchitis
Week 13	Salmonellosis
Week 14	E.coli
Week 16	Infectious bronchitis
	Newcastle disease
	Egg-drop syndrome

4.7 Transfer to the laying house

Pullets were moved to the laying house at the age of 16 weeks (112 days). There were selected 160 birds of the 1st, 4th, 5th, 7th and 8th samples, 240 birds of the 2nd samples, 145 birds of the 3rd and 80 birds of the 6th samples.

5 Production period

5.1 Treatments

160 birds of the 1st, 4th, 5th, 7th and 8th samples, 240 birds of the 2nd samples, 145 birds of the 3rd and 80 birds of the 6th samples were divided in 2 replicates by 80 birds (1st, 4th, 5th, 7th and 8th samples), in 3 replicates by 80 birds (2nd sample), birds from the 3rd sample were divided by 75 and 70 birds and the 6th sample was in one replicate (80 birds). Hens of each treatment were kept in coincident environment conditions.

5.2 Housing system

Hens were kept in windowless house with full climatic control. They were kept in floor system, combination of slatted floor and deep litter. The total floor space of the pen was 11.5 m² – 2/3 slatted floor and 1/3 deep litter (shaving). Belt conveyer for clearance of excrements was used (removed twice a week).

There were tube feeders and nipple automatic drinkers on the slatted floor. 5 cm of tube feeder per 1 layer, 8 layers per 1 nipple. Feed was manually filled in the feeders. Roosts were located above the slatted floor, 15 cm of roost per 1 layer.

There were 2 group nests with size of 120 x 60 cm in each pen (their floor space is not calculated in the total floor space). The floor of the nests was sloping and it was formed by the artificial grass. The nests were automatically closed before the end of the light period. Eggs were collected manually, each treatment separately.

5.3 Environment conditions

The temperature in the house was kept between 18 – 20 °C. Relative humidity was 60 – 70 %. Temperature was regulated by transversal controlled ventilation (fans and air inlets on the opposite side), in cold weather a gas heater was used. Automatic ventilation provided minimum ventilation rate 3 m³/hour/kg live weight in winter and 5 m³/hour/kg live weight in summer.

5.4 Lighting program

Hens were kept in windowless house. Lighting program was controlled according to time setting:

Age	Hours of light
Week 19	14
Week 20	15
Week 21	15.5
Week 22 – end of the test	16

5.5 Feeding

Layers were fed with two types of feed during the production period - N1 IT N start and N1 IT N. This mash complete feed mixture was fed ad libitum.

Feed was produced in xxxxx

Diet formulas

Ingredients		N1 IT N start (19 th -30 th week)	N1 IT N (31 th -46 th week)
Wheat		35.08	42.71
Extr. soybean groats		16.20	11.75
Maize		20.60	18.10
Soybean oil		2.50	2.72
Extr. rape meal		5.00	5.00
Extr. sunflower meal		7.10	7.30
Limestone		2.82	2.88
Limestone-roughly ground		6.60	6.60
Animal fat		2.35	1.25
MCP - monocalciumphosphate		0.55	0.47
Salt		0.28	0.28
Sodium bicarbonate		0.17	0.14
DL-methionine		0.18	0.15
L-lysine		0.12	0.20
Premix		0.45	0.45
Nutrient content (calculated values):			
Crude protein	g/kg	174.00	160.98
Fat	g/kg	67.14	58.03
Linoleic acid	g/kg	23.02	22.98
Crude fiber	g/kg	39.99	39.95
ME	MJ/kg	11.45	11.40
Lysine	g/kg	8.58	7.91
Methionine	g/kg	4.43	4.00
Meth. +cysteine	g/kg	7.66	7.08
Threonine	g/kg	6.30	5.69
Tryptophan	g/kg	2.06	1.88
Ca	g/kg	37.00	37.00
P	g/kg	5.38	5.12
P (digestible)	g/kg	3.91	3.70
Vitamin A	U.I./kg	10000	10000
Vitamin D3	U.I./kg	3000	3000

6 Evaluated parameters

6.1 Incubation and hatching

- weight of hatching eggs
- fertility in %
- hatchability of set eggs in %
- hatchability of fertile eggs in %

6.2 Feed consumption

- per 1 reared pullet
- per 1 hen in production period
- per 1 egg
- per 1 kg of egg mass
- per 1 feeding day

6.3 Live body weight

- at the age of 1 day – group weighing
- at the age of 14 days (2 week), 28 days (4 week), 42 days (6 week), 56 days (8 week), 70 days (10 week), 84 days (12 week), 98 days (14 week) – individual weighing (40 birds per pen)
- at the age of 112 days (16 weeks) – individual weighing
- at the age of 126 days (18 weeks), 140 days (20 weeks), 154 days (22 weeks), 168 days (24 weeks), 182 days (26 weeks), 210 days (30 weeks) – individual weighing (40 birds per pen)
- at the age of days 322 (46 weeks) – individual weighing

6.4 Mortality

- mortality during rearing
- mortality of hens and it's causes

6.5 Egg production

Egg production was recorded daily. Eggs were collected manually at the same time every day. Eggs of different samples were collected separately. Production was evaluated in 7 four week periods, from 127 to 322 days of age.

Results of the egg production:

- per 1 hen housed
- per 1 hen present
- per 1 hen housed for each period

6.6 Sexual maturity

- age of the layers at 10 %, 30 %, 50 % and peak of lay

6.7 Egg weight

- average egg weight for each period
- average egg weight for the whole production
- classification of eggs

6.8 Production of egg mass

- per 1 hen housed
- per 1 hen present

6.9 Second quality eggs

Second quality eggs were sorted out as:

- cracked eggs
- broken eggs
- double-yolk eggs
- shell-less eggs

6.10 Egg quality

- egg weight
- yolk weight
- shell strength
- index of egg shape
- shell thickness
- Haugh units
- yolk colour
- egg shell colour
- presence of blood spots on the yolk

6.11 Eggs on the bedding

- % of eggs laid

7 Results

Tab. No. 1	Results of hatching
Tab. No. 2	Results of the rearing
Tab. No. 3	Mortality during the rearing
Tab. No. 4	Live weight at 20 – 46 weeks of age
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Graph No. 1	Laying intensity

Results of hatching**Tab. No. 1**

Sample		Weight of hatching eggs	Fertility	Hatchability	
				Set eggs	Fertilized eggs
		g	%	%	%
1	xxxxx	52.22	80.40	69.40	86.40
2	xxxxx	53.06	89.60	84.30	94.10
3	xxxxx	57.71	79.40	52.50	66.10
4	xxxxx	52.99	79.00	66.00	83.50
5	xxxxx	56.18	74.90	64.30	85.90
6	xxxxx	59.03	72.40	39.00	53.90
7	xxxxx	57.64	74.60	65.30	87.50
8	xxxxx	59.44	86.30	77.50	89.90

Results of the rearing

Tab. No. 2

Sample		Live weight (in weeks)										Feed consumption per 1 pullet at the age of 126 days
		1 day old	2 nd week	4 th week	6 th week	8 th week	10 th week	12 th week	14 th week	16 th week	18 th week	
		g										
1	xxxxx	34.1	135.0	305.5	434.0	611.5	766.5	905.5	1069.5	1169.5	1285.0	6.71
2	xxxxx	34.3	146.5	264.1	422.3	599.3	795.7	918.7	1080.0	1171.7	1280.3	6.96
3	xxxxx	38.4	157.6	303.3	441.5	621.5	817.0	965.0	1156.5	1258.0	1409.0	6.70
4	xxxxx	33.9	140.6	280.4	435.5	632.5	846.5	1044.0	1233.5	1406.5	1530.0	7.13
5	xxxxx	34.8	135.5	265.9	418.0	629.5	808.5	953.0	1149.0	1252.0	1419.0	7.03
6	xxxxx	37.7	137.8	297.5	479.0	705.0	900.0	1095.0	1323.0	1414.0	1575.0	7.17
7	xxxxx	37.5	146.5	292.9	462.5	695.0	868.0	995.0	1138.0	1232.5	1355.5	7.27
8	xxxxx	36.1	148.0	293.3	469.0	710.0	903.0	1057.5	1270.5	1393.0	1543.5	7.08

Mortality during the rearing**Tab. No. 3**

Sample		Number of pullets			
		Initial flock	Final flock	Mortality	
		birds	birds	birds	%
1	xxxxx	200	192	8	4.00
2	xxxxx	280	274	6	2.14
3	xxxxx	165	157	8	4.85
4	xxxxx	200	196	4	2.00
5	xxxxx	200	194	6	3.00
6	xxxxx	110	106	4	3.64
7	xxxxx	200	194	6	3.00
8	xxxxx	200	193	7	3.50

Live weight of laying hens**Tab. No. 4**

Sample		Live weight (g)					
		20 weeks	22 weeks	24 weeks	26 weeks	30 weeks	final live weight
1	xxxxx	1461.5	1554.0	1549.5	1616.5	1680.0	1705.5
2	xxxxx	1410.7	1533.0	1607.0	1622.5	1685.3	1677.8
3	xxxxx	1553.5	1623.0	1628.5	1662.5	1717.0	1831.8
4	xxxxx	1665.5	1808.5	1889.5	1975.0	2028.0	2175.2
5	xxxxx	1593.5	1706.5	1738.0	1743.0	1788.0	1894.7
6	xxxxx	1778.0	1911.0	1960.0	1940.0	2053.0	2088.9
7	xxxxx	1509.0	1618.5	1679.5	1705.5	1813.0	1810.1
8	xxxxx	1683.0	1731.5	1808.0	1838.0	1879.0	1967.5

Results of the egg yield

Tab. No. 5

Sample		Age at the yield					Egg production per				Egg weight	Egg mass per	
		10%	30%	50%	Max.		hen - housed		hen - day			hen - housed	hen - day
					day	%	number	%	number	%	g		
1	xxxxx	142	151	154	197	89.38	128.88	65.75	135.79	69.28	58.89	7.59	8.00
2	xxxxx	151	161	169	179	84.58	113.76	58.04	114.64	58.49	53.67	6.11	6.15
3	xxxxx	142	152	158	207	89.66	126.14	64.36	135.90	69.34	61.20	7.72	8.32
4	xxxxx	159	166	174	197	81.88	117.98	60.19	125.04	63.80	60.77	7.17	7.60
5	xxxxx	148	155	160	197	96.25	135.27	69.01	141.17	72.03	54.22	7.33	7.65
6	xxxxx	151	158	174	197	78.75	114.85	58.60	119.46	60.95	60.67	6.97	7.25
7	xxxxx	146	153	159	201	99.38	145.39	74.18	148.90	75.97	62.57	9.10	9.32
8	xxxxx	136	143	152	202	96.25	159.66	81.46	162.43	82.87	64.11	10.24	10.41

Feed consumption**Tab. No. 6**

Sample		Feed consumption			
		per 1 hen	per 1 egg	per 1 kg of egg mass	per 1 feeding day
		kg	g	kg	g
1	xxxxx	20.42	150.34	2.55	104.16
2	xxxxx	22.13	193.01	3.60	112.89
3	xxxxx	21.31	156.81	2.56	108.73
4	xxxxx	24.64	197.08	3.24	125.73
5	xxxxx	23.99	169.94	3.13	122.40
6	xxxxx	22.89	191.58	3.16	116.77
7	xxxxx	22.49	151.01	2.41	114.73
8	xxxxx	25.24	155.40	2.42	128.79

Mortality and it's causes

Tab. No. 7

Sample		Number of hens				Causes														
		Start of lay	End of lay	Mortality		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		birds	birds	birds	%															
1	xxxxx	160	144	16	10.00		1			1				14						
2	xxxxx	240	236	4	1.67									2	1	1				
3	xxxxx	145	128	17	11.72									11	1	5				
4	xxxxx	160	144	16	10.00						4			8	1	3				
5	xxxxx	160	149	11	6.88									9		2				
6	xxxxx	80	75	5	6.25									3		2				
7	xxxxx	160	151	9	5.63									5		4				
8	xxxxx	160	154	6	3.75									6						

- Diagnostic:
- | | | |
|-------------------------|------------------------------------|---|
| 1 – Viral diseases | 6 – Injuries | 11 – Metabolic derangement |
| 2 – Bacterial diseases | 7 – Digestive tract diseases | 12 – Cannibalism |
| 3 – Fungal diseases | 8 – Respiratory tract diseases | 13 – Diverticulus inflammation |
| 4 – Parasitary diseases | 9 – Reproduction tract diseases | 14 – Culling and othercauses |
| 5 – Tumors | 10 – Locomotion apparatus diseases | 15 – Sampling (excluded of calculation) |

Share of nonstandard eggs

Tab. No. 8

Sample		Eggs laid	Cracked eggs		Broken eggs		Double-yolked eggs		Membranes		Nonstandard together	
		number	number	%	number	%	number	%	number	%	number	%
1	xxxxx	20620	1228	5.96	344	1.67	0	0.00	0	0.00	1572	7.62
2	xxxxx	27302	1735	6.35	576	2.11	0	0.00	0	0.00	2311	8.46
3	xxxxx	18291	1153	6.30	435	2.38	0	0.00	0	0.00	1588	8.68
4	xxxxx	18877	1550	8.21	386	2.04	7	0.04	1	0.01	1944	10.30
5	xxxxx	21643	1359	6.28	389	1.80	0	0.00	1	0.00	1749	8.08
6	xxxxx	9188	691	7.52	213	2.32	12	0.13	0	0.00	916	9.97
7	xxxxx	23263	1483	6.37	463	1.99	63	0.27	0	0.00	2009	8.64
8	xxxxx	25545	1540	6.03	538	2.11	369	1.44	5	0.02	2452	9.60

Weight classes of eggs

Tab. No. 9

Sample		Average egg weight	XL	L	M	S
			(= > 73 g)	(63 - 73 g)	(53 - 63 g)	(= < 53 g)
		g	%	%	%	%
1	xxxxx	58.89	1.45	34.58	51.57	12.39
2	xxxxx	53.67	0.04	2.92	51.02	46.02
3	xxxxx	61.20	6.71	41.10	46.53	5.66
4	xxxxx	60.77	2.65	36.83	53.28	7.25
5	xxxxx	54.22	0.29	6.48	57.09	36.13
6	xxxxx	60.67	1.23	38.12	55.83	4.82
7	xxxxx	62.57	5.44	46.86	46.54	1.16
8	xxxxx	64.11	10.63	53.64	34.85	0.88

Egg quality - 3rd egg period

Tab. No. 10a

Sample		Egg weight g	Yolk weight g	Egg shell strength N	Index of egg shape	Egg shell thickness mm	Haugh's units	Yolk colour				Egg shell colour			Blood spot
								L	a	b	Roche	L	a	b	
1	xxxxxx	58.28	13.87	43.55	1.24	0.36	96.68	-5.97	3.57	8.75	12.17	65.62	17.67	28.17	0
2	xxxxxx	52.21	14.35	48.36	1.34	0.37	96.28	-3.70	2.96	10.54	10.83	88.57	-3.69	5.94	0
3	xxxxxx	59.82	14.68	45.02	1.25	0.36	96.12	-6.25	3.73	8.43	12.43	63.83	18.52	27.62	0
4	xxxxxx	58.75	14.86	46.56	1.27	0.38	99.33	-6.03	3.75	8.72	12.22	50.25	25.80	27.65	0
5	xxxxxx	53.87	14.34	46.14	1.31	0.36	97.22	-5.25	3.50	9.32	11.85	72.72	0.82	19.82	0
6	xxxxxx	60.44	16.08	55.51	1.29	0.38	95.57	-5.30	3.23	9.40	11.67	49.87	26.60	29.20	0
7	xxxxxx	62.45	15.52	49.70	1.32	0.38	98.15	-3.82	2.83	10.47	10.85	91.90	-3.13	3.03	1
8	xxxxxx	64.76	16.65	55.30	1.29	0.39	97.62	-4.48	3.08	9.87	11.33	78.22	-0.77	16.13	0

Interpretative notes:

L – colour of egg (0=black, 100=white)

a – red colouring and it's fullness

b – yellow colouring and it's fullness

Egg quality - 5th egg period

Tab. No. 10b

Sample		Egg weight g	Yolk weight g	Egg shell strength N	Index of egg shape	Egg shell thickness mm	Haugh's units	Yolk colour				Egg shell colour			Blood spot
								L	a	b	Roche	L	a	b	
1	xxxxxx	60.57	15.80	45.29	1.26	0.38	92.40	-5.62	2.92	8.97	11.32	68.35	15.15	27.23	0
2	xxxxxx	54.69	16.81	43.96	1.34	0.37	94.02	-2.41	2.44	11.59	10.03	90.38	-2.06	5.34	0
3	xxxxxx	63.87	17.46	45.24	1.27	0.36	92.52	-4.87	2.83	9.63	11.03	66.92	16.28	26.98	1
4	xxxxxx	62.67	17.53	50.33	1.29	0.39	95.95	-4.22	3.12	10.20	11.08	52.67	24.50	29.17	0
5	xxxxxx	55.19	16.24	44.90	1.32	0.37	94.48	-3.13	2.60	10.95	10.28	73.80	3.75	20.85	0
6	xxxxxx	61.57	17.15	51.10	1.31	0.38	93.33	-5.47	3.27	9.13	11.67	53.20	23.87	30.50	0
7	xxxxxx	63.69	18.08	50.67	1.33	0.38	94.23	-1.58	1.95	12.25	9.20	93.00	-2.25	2.25	0
8	xxxxxx	65.13	18.22	53.49	1.31	0.39	94.50	-2.85	2.55	11.20	10.20	80.82	-1.18	15.12	1

Interpretative notes:

L – colour of egg (0=black, 100=white)

a – red colouring and it's fullness

b – yellow colouring and it's fullness

Egg quality - 7th egg period

Tab. No. 10c

Sample		Egg weight g	Yolk weight g	Egg shell strength N	Index of egg shape	Egg shell thickness mm	Haugh's units	Yolk colour				Egg shell colour			Blood spot
								L	a	b	Roche	L	a	b	
1	xxxxxx	62.96	16.82	40.64	1.27	0.37	88.30	-8.20	3.72	6.92	13.17	68.35	14.95	27.15	1
2	xxxxxx	55.54	16.80	42.94	1.34	0.37	92.17	-3.62	2.99	10.72	10.82	88.89	-3.10	5.01	0
3	xxxxxx	63.77	17.36	43.43	1.27	0.36	88.27	-6.57	3.38	8.20	12.33	66.53	15.58	26.87	4
4	xxxxxx	63.26	17.70	47.58	1.30	0.38	91.12	-6.38	3.92	8.42	12.62	53.17	23.28	29.78	5
5	xxxxxx	57.58	16.83	41.47	1.34	0.37	91.47	-5.37	3.50	9.27	11.93	75.35	0.27	18.43	1
6	xxxxxx	62.39	17.56	51.03	1.30	0.39	87.20	-6.47	3.97	8.43	12.83	52.43	23.50	29.10	1
7	xxxxxx	64.54	17.83	41.44	1.32	0.37	95.60	-5.25	3.18	9.27	11.70	92.07	-1.93	2.18	0
8	xxxxxx	65.54	18.10	40.53	1.31	0.37	95.78	-6.62	3.85	8.20	12.63	80.97	-1.50	14.40	1

Interpretative notes:

L – colour of egg (0=black, 100=white)

a – red colouring and it's fullness

b – yellow colouring and it's fullness

Laying intensity
in four weeks long periods (%)

Tab. No. 11

Sample		Period						
		1	2	3	4	5	6	7
1	xxxxx	25.58	77.97	77.23	74.44	71.07	66.61	67.37
2	xxxxx	8.44	67.37	74.87	66.19	62.11	62.53	64.78
3	xxxxx	23.87	70.25	75.37	74.29	72.36	66.50	67.88
4	xxxxx	4.29	49.98	75.07	75.76	73.21	71.25	71.81
5	xxxxx	17.25	80.51	84.20	79.22	77.61	72.50	71.81
6	xxxxx	7.86	56.92	70.13	71.03	72.28	66.34	65.63
7	xxxxx	19.00	78.39	85.42	84.35	84.35	83.57	84.17
8	xxxxx	38.91	85.00	88.97	89.13	88.91	89.17	90.11

Average egg weight
in four weeks long periods (g)

Tab. No. 12

Sample		Period						
		1	2	3	4	5	6	7
1	xxxxx	46.72	53.55	57.73	59.78	61.65	62.06	64.02
2	xxxxx	41.40	48.82	52.28	53.21	54.98	56.32	58.61
3	xxxxx	48.49	55.32	60.07	61.83	64.15	64.84	65.59
4	xxxxx	48.15	54.84	58.58	61.23	62.11	62.95	63.89
5	xxxxx	43.92	51.25	53.55	54.32	55.21	56.27	57.58
6	xxxxx	48.70	55.62	59.87	61.47	62.23	61.46	63.94
7	xxxxx	50.69	58.34	62.22	63.67	64.54	64.69	64.40
8	xxxxx	54.47	62.24	65.07	65.82	66.18	64.60	64.90

Eggs on the bedding
in four weeks long periods (%)

Tab. No. 13

Sample		Box no.	Period						
			1	2	3	4	5	6	7
1	xxxxxx	1	0.86	0.17	0.06	0.18	0.00	0.13	0.19
		9	3.46	0.07	0.18	0.06	0.12	0.20	0.07
2	xxxxxx	2	13.20	2.90	0.88	0.43	1.20	0.80	0.80
		10	3.08	7.36	2.39	0.70	1.43	1.13	1.60
		14	1.28	1.81	0.71	0.13	0.51	1.28	0.67
3	xxxxxx	3	5.75	2.20	0.39	0.07	0.14	0.36	0.57
		11	10.71	5.08	5.27	5.51	5.63	6.46	6.55
4	xxxxxx	4	0.00	0.88	0.06	0.12	0.00	0.00	0.06
		12	2.17	2.01	0.39	0.22	0.35	0.06	0.06
5	xxxxxx	5	1.45	0.79	0.38	0.12	0.06	0.00	0.00
		13	9.23	2.70	1.95	0.93	2.18	1.14	0.18
6	xxxxxx	6	0.76	1.09	0.70	0.38	0.49	0.34	0.21
7	xxxxxx	7	0.40	0.57	0.77	0.47	1.26	0.96	0.89
		15	0.72	0.93	0.16	0.00	0.00	0.05	0.16
8	xxxxxx	8	0.18	0.21	0.40	0.40	0.15	0.20	0.25
		16	0.17	0.26	0.10	0.00	0.15	0.00	0.05

Graph no. 1: laying intensity

