



MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE
ÚSTRAŠICE státní podnik

390 02 Tábor 2

Česká republika

Final report

PEKIN – TEST no. 173

2023

XXXXX

14 March – 1 May 2023

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Ústrašice, June 2023

Basic tests information

The basic dates

Beginning of the test: 12 February 2023 (put into the incubator)
14 March 2023 (day old ducklings)
End of the test: 25 April 2023 – 42 days of age
2 May 2023 – 49 days of age

Location

Mezinárodní testování drůbeže, s.p. Ústrašice – Testační stanice vodní drůbeže (Test station of water fowl).

Material and methods

Material

420 ducklings in treatment No. 1 and 560 ducklings in treatment No. 2 and 3 – divided in 6 pens – 3 pens by 70 males and 3 pens by 70 females in treatment No. 1 and in 8 pens – 4 pens by 70 males and 4 pens by 70 females in treatment No. 2 and 3. Total there were 1540 ducklings.

Origin of hatching eggs:

Sample		Cross	Breeding organization	State
1	T1	xxxxxx	xxxxxx	xxxxxx
2	T2	xxxxxx	xxxxxx	xxxxxx
3	T3	xxxxxx	xxxxxx	xxxxxx

Housing system

Ducklings were housed in deep litter rearing. Drinking water was supplied ad libitum by automatic nipple drinkers. Each pen was equipped with manually filled tube feeders.

Lighting program

Day 1 – 7 23 hours of light
Day 8 – 46 18 hours of light
Day 47 – 49 23 hours of light

Stocking density

Day 1 – 49 7.3 birds/m²

Feeding

Feed was produced in xxxxx

Day 1 – 21 Starter „VKCH 1“

Day 22 – 35 Grower „VKCH 2”

Day 36 – 49 Finisher „VKCH 3“

The diets were calculated following Czech feeding recommendations.

Formulas of the feed

Components (%)	VKCH 1	VKCH 2	VKCH 3
Maize	10.000	10.000	7.000
Wheat	45.710	59.520	63.280
Extr. soybean meal	27.500	14.500	11.500
Rape seed meal	5.000	5.000	5.000
Wheat brans	5.000	4.000	7.000
Soybean oil	2.400	3.200	2.500
DL-methionine	0.290	0.160	0.170
L-lysine HCl	0.310	0.300	0.230
L-threonine	0.130	0.160	0.200
Limestone	1.410	1.750	1.750
MCP-monocalciumphosphate	1.200	0.400	0.400
Soda bicarbona	0.100	0.180	0.180
NaCl	0.400	0.300	0.260
Aminovitan VKCH-1 spec 0,2%	0.200	-	-
Aminovitan VKCH-2 spec 0,2%	-	0.200	0.200
Premix of cholin-chlorid 0,3%	0.300	0.300	0.300
Avizyme Porzyme XP	0.050	-	-
Axtra PHY 1500L+Xyl. 40000L	-	0.030	0.030
Nutrients (calculated values):			
CP (%)	22.369	18.088	17.285
ME (MJ/kg)	11.912	12.875	12.589
Lysine (g/kg)	13.411	10.054	8.862
Methionine (g/kg)	6.090	4.255	4.253
Threonine (g/kg)	9.052	7.503	7.546
Ca (g/kg)	10.482	10.258	10.240
P (g/kg)	7.463	5.138	5.337
Na (g/kg)	1.989	1.823	1.669

Veterinary precautions

The house were disinfected by xxxxx before the duck placement. There was used the wet disinfection and the gaseous disinfection.

Parameters recorded and Methods applied

Live weight

Live weight was measured on day 1 (all the birds in each pen were weighed altogether). On days 21, 28 and 35 (all the birds were weighed individually, without fasting) and 42 and 49 (all the birds were weighed individually after 12 hours of fasting).

Weight gain and average daily weight gain

Weight gains were calculated for the periods 1-21 days, 22-28 days, 29-35 days, 36-42 days, 43-49 days and for the overall experiment (1-49 days).

Feed conversion ratio

Feed consumption per 1 kg of live weight was recorded per pen on days 21, 28, 35, 42 and 49.

Feed consumption

Feed consumption was calculated for the periods 1-21 days, 22-28 days, 29-35 days, 36-42 days, 43-49 days and for the overall experiment (1-49 days).

Mortality

All pens were checked twice a day to see if there were any dead or ill birds. Dead chickens were registered by date and reason of mortality on the day of death.

Carcass analysis

The carcass analysis was done at 42 days and 49 days. The breast muscles were weighed with skin and thigh muscles were weighed with skin.

Scheme of carcass analysis

Day of carcass analysis	Treatment no.	Pen no.	Ducks per pen	Total ducks per treatment	Total ducks per day
42	1	16 (♂)	70	140	560
		13 (♀)	70		
	2	17 (♂)	70	210	
		23 (♂)	70		
		20 (♀)	70		
	3	18 (♂)	70	210	
		24 (♂)	70		
		21 (♀)	70		
	49	1	4 (♂)	70	
10 (♂)			70		
1 (♀)			70		
7 (♀)			70		
2		5 (♂)	70	210	
		11 (♂)	70		
		8 (♀)	70		
3		6 (♂)	70	210	
		12 (♂)	70		
		9 (♀)	70		

Statistical analyses

Performance results of live weight (on days 35, 42 and 49) and results of carcass analysis (on days 42 and 49) were statistically evaluated using the ANOVA model (Scheffe test, Duncan test) or Kruskal-Wallis test (nonparametric method).

Results

Tab. No.	1 Hatching results
	2 Performance results:
	2a Body weight
	2b Weight gain
	2c Feed conversion ratio
	2d Feed consumption
	3a Results of carcass analysis at the age 42
	3b Results of carcass analysis at the age 49
	4 Mortality
	5 Statistical analysis
	(For a detailed analysis of results the following methods were applied: divergence valuation. variations coeff. valuation. average divergence.)
	6 Statistical analyses of performance results – live weight
	7 Statistical analyses – carcass analysis at 42 days
	8 Statistical analyses – carcass analysis at 49 days
	9 Performance results per pen:
	9a Body weight
	9b Weight gain
	9c Feed conversion ratio
	9d Feed consumption

Hatching results**Tab. No. 1**

Treatment	Treat. no.	Fertility	Hatchability		Birds housed		Average weight		
			Set eggs	Fertilized eggs	Males	Females	Hatching eggs	Day old males	Day old females
		%	%	%	number	number	g	g	g
T1	1	69.50	56.00	80.58	210	210	94.63	60.05	59.67
T2	2	97.25	83.88	86.25	280	280	85.36	53.18	53.04
T3	3	99.25	85.00	85.64	280	280	93.00	59.29	59.36

Performance results

Body weight per phases

Tab. No. 2a

Treatment	Tr. no.	Day 1		Day 21		Day 28		Day 35		Day 42		Day 49	
		Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight
			g		g		g		g				
T1	1	420	59.86	420	1565.03	418	2244.15	415	3124.60	415	3582.58	275	3996.31
T2	2	560	53.11	560	1492.92	558	2159.57	557	2987.73	556	3416.80	275	3818.88
T3	3	560	59.32	559	1521.02	556	2195.76	555	3066.44	554	3469.84	279	3786.57

Treatment	Tr. no.	Sex	Day 1		Day 21		Day 28		Day 35		Day 42		Day 49	
			Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight
				g		g		g		g				
T1	1	♂	210	60.05	210	1579.83	210	2263.66	209	3168.00	209	3658.27	138	4159.11
		♀	210	59.67	210	1550.22	208	2224.44	206	3080.57	206	3505.78	137	3832.32
T2	2	♂	280	53.18	280	1502.39	279	2156.91	279	2975.70	278	3473.00	137	3919.57
		♀	280	53.04	280	1483.46	279	2162.23	278	2999.80	278	3360.60	138	3718.91
T3	3	♂	280	59.29	280	1531.62	280	2199.56	280	3113.43	279	3523.31	140	3943.80
		♀	280	59.36	279	1510.38	276	2191.90	275	3018.59	275	3415.59	139	3628.20

Weight gain per phases

Tab. No. 2b

Treatment	Tr. no.	Day 1 - 21		Day 22 - 28		Day 29 - 35		Day 36 - 42		Day 43-49		Day 1 – 49	
		Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Weight gain per phase	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain
		g	g	g	g	g	g	g	g	g	g	g	g
T1	1	1505.17	71.67	679.12	97.02	880.45	125.78	457.98	65.43	413.73	59.10	3936.45	80.34
T2	2	1439.82	68.56	666.65	95.24	828.16	118.31	429.07	61.30	402.07	57.44	3765.77	76.85
T3	3	1461.70	69.60	674.74	96.39	870.68	124.38	403.40	57.63	316.73	45.25	3727.24	76.07

Treatment	Tr. no.	Sex	Day 1 - 21		Day 22 - 28		Day 29 - 35		Day 36 - 42		Day 43 - 49		Day 1 – 49	
			Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain
			g	g	g	g	g	g	g	g	g	g	g	g
T1	1	♂	1519.78	72.37	683.83	97.69	904.34	129.19	490.27	70.04	500.84	71.55	4099.06	83.65
		♀	1490.56	70.98	674.22	96.32	856.13	122.30	425.21	60.74	326.54	46.65	3772.65	76.99
T2	2	♂	1449.21	69.01	654.53	93.50	818.79	116.97	497.30	71.04	446.57	63.80	3866.39	78.91
		♀	1430.43	68.12	678.77	96.97	837.57	119.65	360.81	51.54	358.31	51.19	3665.88	74.81
T3	3	♂	1472.34	70.11	667.94	95.42	913.88	130.55	409.88	58.55	420.49	60.07	3884.51	79.28
		♀	1451.02	69.10	681.52	97.36	826.69	118.10	397.00	56.71	212.61	30.37	3568.84	72.83

Feed conversion ratio (Feed consumption per 1 kg of live weight)

Tab. No. 2c

Treatment	Tr. no.	Feed conversion ratio				
		Day 21	Day 28	Day 35	Day 42	Day 49
		g/kg LW	g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	1340.92	1574.32	1734.62	2138.46	2447.08
T2	2	1392.40	1610.90	1770.20	2175.51	2485.64
T3	3	1371.60	1585.30	1716.75	2104.26	2438.54

Treatment	Tr. no.	Sex	Feed conversion ratio				
			Day 21	Day 28	Day 35	Day 42	Day 49
			g/kg LW	g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	♂	1326.85	1548.27	1700.62	2090.43	2399.31
		♀	1355.26	1601.09	1770.10	2189.31	2499.30
T2	2	♂	1383.99	1605.91	1761.94	2116.95	2403.06
		♀	1400.92	1615.88	1778.42	2236.02	2572.05
T3	3	♂	1365.50	1579.38	1682.92	2069.17	2352.34
		♀	1377.80	1591.33	1752.29	2140.99	2532.92

Feed consumption per phases

Tab. No. 2d

Treatment	Tr.. no.	Feed consumption					
		Starter (1-21 days)	Grower (22-28 days)	Grower (29-35 days)	Finisher (36-42 days)	Finisher (43-49 days)	Total
		kg	kg	kg	kg	kg	kg
T1	1	881.40	595.40	772.50	930.10	571.40	3750.80
T2	2	1164.10	777.10	1004.70	1187.00	560.30	4693.20
T3	3	1166.20	769.20	986.30	1123.30	543.50	4588.50

Treatment	Tr.. no.	Sex	Feed consumption					Total
			Starter (1-21 days)	Grower (22-28 days)	Grower (29-35 days)	Finisher (36-42 days)	Finisher (43-49 days)	
			kg	kg	kg	kg	kg	
T1	1	♂	440.20	295.80	390.00	472.30	302.90	1901.20
		♀	441.20	299.60	382.50	457.80	268.50	1849.60
T2	2	♂	582.20	384.20	496.40	581.10	283.30	2327.20
		♀	581.90	392.90	508.30	605.90	277.00	2366.00
T3	3	♂	585.60	387.10	494.40	566.90	280.30	2314.30
		♀	580.60	382.10	491.90	556.40	263.20	2274.20

Results of carcass analysis with skin at the age 42 days

Tab. No. 3a

Treatment	Tr. no.	Sex	Weight				Ratio of abd. fat to live weight	Breast muscles with skin			Thigh muscles with skin			Total muscles with skin			Carcass	
			Total	Body	Gibl.	Abd. fat		Weight	Percentage		Weight	Percentage		Weight	Percentage		Value	Yield
									Total weight	Body carcass		Total weight	Body carcass		Total weight	Body carcass		
			g	g	g	g		g	%	%	%	g	%	%	g	%	%	%
T1	1	♂	3577	2361	359	29	0.82	652	18.22	27.59	579	16.19	24.53	1231	34.41	52.12	66.02	76.05
		♀	3489	2356	321	36	1.02	690	19.77	29.29	584	16.72	24.77	1274	36.50	54.06	67.52	76.73
		∅	3533	2359	340	32	0.92	671	18.98	28.43	581	16.45	24.65	1252	35.43	53.08	66.76	76.38
T2	2	♂	3447	2222	349	26	0.75	586	16.99	26.35	555	16.09	24.96	1140	33.08	51.32	64.45	74.58
		♀	3309	2214	305	34	1.01	619	18.71	27.96	541	16.36	24.45	1161	35.07	52.41	66.92	76.12
		∅	3401	2219	334	28	0.84	597	17.54	26.89	550	16.18	24.79	1147	33.72	51.68	65.25	75.08
T3	3	♂	3465	2303	329	28	0.82	689	19.89	29.93	537	15.50	23.33	1226	35.39	53.25	66.46	75.97
		♀	3575	2318	344	27	0.76	686	19.18	29.59	537	15.01	23.15	1223	34.20	52.74	64.84	74.47
		∅	3502	2308	334	28	0.80	688	19.65	29.81	537	15.34	23.27	1225	34.99	53.08	65.91	75.46

Results of carcass analysis with skin at the age 49 days

Tab. No. 3b

Treatment	Tr. no.	Sex	Weight				Ratio of abd. fat to live weight	Breast muscles with skin			Thigh muscles with skin			Total muscles with skin			Carcass	
			Total	Body	Gibl.	Abd. fat		Weight	Percentage		Weight	Percentage		Weight	Percentage		Value	Yield
									Total weight	Body carcass		Total weight	Body carcass		Total weight	Body carcass		
			g	g	g	g		%	g	%	%	g	%	%	g	%	%	%
T1	1	♂	4159	2824	365	39	0.95	869	20.89	30.77	641	15.41	22.70	1510	36.30	53.47	67.90	76.68
		♀	3832	2643	314	48	1.24	836	21.81	31.62	603	15.73	22.80	1439	37.54	54.43	68.97	77.16
		∅	3996	2734	340	43	1.09	852	21.33	31.18	622	15.56	22.75	1474	36.89	53.93	68.41	76.91
T2	2	♂	3920	2586	367	36	0.92	760	19.40	29.41	595	15.19	23.03	1356	34.59	52.44	65.97	75.33
		♀	3700	2482	313	44	1.18	745	20.14	30.04	569	15.36	22.91	1314	35.51	52.95	67.06	75.52
		∅	3845	2550	349	39	1.00	755	19.64	29.62	586	15.25	22.99	1342	34.89	52.61	66.32	75.39
T3	3	♂	3944	2656	361	35	0.88	841	21.33	31.67	572	14.50	21.52	1413	35.83	53.19	67.36	76.52
		♀	3613	2435	303	40	1.10	776	21.48	31.87	535	14.80	21.96	1311	36.28	53.83	67.39	75.77
		∅	3833	2582	342	36	0.95	820	21.38	31.74	559	14.59	21.66	1379	35.97	53.39	67.37	76.28

Mortality

Tab. No. 4

Treatment	Tr. no.	Mortality in the period							Mortality according causes														
		Day 1-21	Day 22-28	Day 29-35	Day 36-42	Day 43-49	Day 1-49		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
		birds	birds	birds	birds	birds	birds	%															
T1	1	0	2	3	0	1	6	1.43										4	2				
T2	2	0	2	1	1	1	5	0.89										4	1				
T3	3	1	3	1	1	0	6	1.07										5	1				

Treatment	Tr. no.	Sex	Mortality in the period							Mortality according causes													
			Day 1-21	Day 22-28	Day 29-35	Day 36-42	Day 43-49	Day 1-49		1	2	3	4	5	6	7	8	9	10	11	12	13	14
			birds	birds	birds	birds	birds	birds	%														
T1	1	♂	0	0	1	0	1	2	0.95									1	1				
		♀	0	2	2	0	0	4	1.90									3	1				
T2	2	♂	0	1	0	1	1	3	1.07									3					
		♀	0	1	1	0	0	2	0.71									1	1				
T3	3	♂	0	0	0	1	0	1	0.36										1				
		♀	1	3	1	0	0	5	1.79									5					

Diagnostic:

- 1 - Virus caused diseases
- 2 - Bacteria caused diseases
- 3 - Mould caused diseases
- 4 - Parasite caused diseases
- 5 - Tumors

- 6 - Injuries
- 7 - Gastrointest diseases
- 8 - Respiratory diseases
- 9 - Reproduct. org. diseases
- 10 - Mobility app. diseases

- 11 - Sudden death syndrome
- 12 - Cannibalism
- 13 - Yolk sac. inflam.
- 14 - Other causes

Statistical analysis of body weight on day 42

Tab. No. 5a

Treatment	Tr. No.	Males				Females			
		Number of birds	Average body weight	Divergence valuation	Variations coeff. valuation	Number of birds	Average body weight	Divergence valuation	Variations coeff. valuation
			g/birds	g/birds	%		g/birds	g/birds	%
T1	1	209	3658.27	298.51	8.16	206	3505.78	262.49	7.49
T2	2	278	3473.00	303.18	8.73	278	3360.60	279.88	8.33
T3	3	279	3523.31	276.66	7.85	275	3415.59	273.76	8.02

Statistical analysis of body weight on day 49

Tab. No. 5b

Treatment	Tr. No.	Males				Females			
		Number of birds	Average body weight	Divergence valuation	Variations coeff. valuation	Number of birds	Average body weight	Divergence valuation	Variations coeff. valuation
			g/birds	g/birds	%		g/birds	g/birds	%
T1	1	138	4159.11	261.64	6.29	137	3832.32	294.38	7.68
T2	2	137	3919.57	322.84	8.24	138	3718.91	298.60	8.03
T3	3	140	3943.80	309.36	7.84	139	3628.20	260.98	7.19

Statistical analyses of performance results – live weight

Performance results were statistically evaluated using the ANOVA model (Sheffe test).

The following symbols are used for levels of significance:

$p \leq 0.001$	***	- differences are very high significant
$p \leq 0.01$	**	- differences are high significant
$p \leq 0.05$	*	- differences are significant
$p > 0.05$	o	- differences are not significant

Average body weight on day 35 (by sex)

Tab. No. 6a

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test				
				(g)		T1	T2	T3		
T1	1	♂	209	3168.00	267.46	0.000000	***	o		
T2	2		279	2975.70					0.000000	***
T3	3		280	3113.43					0.069883	0.000000

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test				
				(g)		T1	T2	T3		
T1	1	♀	206	3080.57	239.68	0.001925	**	*		
T2	2		278	2999.80					0.001925	0.671227
T3	3		275	3018.59					0.025298	

Average body weight on day 35 (both sexes together)

Treatment	Treat. No.	No. of birds	Average	Standard deviation	Scheffe test				
			(g)		T1	T2	T3		
T1	1	415	3124.60	257.49	0.000000	***	**		
T2	2	557	2987.73					0.000000	***
T3	3	555	3066.44					0.002177	0.000002

Average body weight on day 42 (by sex)

Tab. No. 6b

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	209	3658.27	298.51		***	***
T2	2		278	3473.00	303.18	0.000000		o
T3	3		279	3523.31	276.66	0.000004	0.128181	

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♀	206	3505.78	262.49		***	**
T2	2		278	3360.60	279.88	0.000000		o
T3	3		275	3415.59	273.76	0.001709	0.061235	

Average body weight on day 42 (both sexes together)

Treatment	Treat. No.	No. of birds	Average	Standard deviation	Scheffe test		
			(g)		T1	T2	T3
T1	1	415	3582.58	291.05		***	***
T2	2	556	3416.80	296.87	0.000000		**
T3	3	554	3469.84	280.21	0.000000	0.009581	

Average body weight on day 49 (by sex)

Tab. No. 6c

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	138	4159.11	261.64		***	***
T2	2		137	3919.57	322.84	0.000000		o
T3	3		140	3943.80	309.36	0.000000	0.796839	

Treatment	Treat. No.	Sex	No. of birds	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♀	137	3832.32	294.38		**	***
T2	2		138	3718.91	298.60	0.004656		*
T3	3		139	3628.20	260.98	0.000000	0.030919	

Average body weight on day 49 (both sexes together)

Treatment	Treat. No.	No. of birds	Average	Standard deviation	Scheffe test		
			(g)		T1	T2	T3
T1	1	275	3996.31	322.54		***	***
T2	2	275	3818.88	326.21	0.000000		o
T3	3	279	3786.57	326.58	0.000000	0.504943	

Statistical analyses of performance results – carcass analysis

Performance results were statistically evaluated using the ANOVA model (Scheffe test, Duncan test) or Kruskal-Wallis test (nonparametric method).

The following symbols are used for levels of significance:

$p \leq 0.001$	***	- differences are very high significant
$p \leq 0.01$	**	- differences are high significant
$p \leq 0.05$	*	- differences are significant
$p > 0.05$	o	- differences are not significant

Weight of Breast muscles with skin at 42 days (by sex)

Tab. No. 7a

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	70	651.60	75.47		***	**
T2	2		140	585.51	79.62	0.000000		***
T3	3		139	689.21	71.59	0.003498	0.000000	

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Kruskal-Wallis test		
				(g)		T1	T2	T3
T1	1	♀	69	690.00	70.30		***	o
T2	2		70	619.11	93.83	0.000012		***
T3	3		69	685.88	68.39	1.000000	0.000113	

Weight of Breast muscles with skin at 42 days (both sexes together)

Treatment	Treat. No.	No. of measurement	Average	Standard deviation	Kruskal-Wallis test		
			(g)		T1	T2	T3
T1	1	139	670.66	75.20		o	***
T2	2	210	596.71	85.88	0.321524		***
T3	3	208	688.11	70.40	0.000000	0.000000	

Weight of Thigh muscles with skin at 42 days (by sex)

Tab. No. 7b

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	70	579.14	47.46		**	***
T2	2		140	554.63	52.09	0.003326		*
T3	3		139	537.19	46.92	0.000000	0.013157	

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♀	69	583.57	48.03		***	***
T2	2		70	541.43	55.87	0.000006		o
T3	3		69	536.72	42.28	0.000000	0.852605	

Weight of Thigh muscles with skin at 42 days (both sexes together)

Treatment	Treat. No.	No. of measurement	Average	Standard deviation	Scheffe test		
			(g)		T1	T2	T3
T1	1	139	581.34	47.62		***	***
T2	2	210	550.23	53.61	0.000000		*
T3	3	208	537.04	45.33	0.000000	0.023857	

Weight of Breast muscles with skin at 49 days (by sex)

Tab. No. 8a

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	138	868.87	79.17		***	*
T2	2		137	760.44	96.63	0.000000		***
T3	3		140	841.31	99.49	0.046025	0.000000	

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Kruskal-Wallis test		
				(g)		T1	T2	T3
T1	1	♀	137	835.87	94.45		***	***
T2	2		70	745.39	84.73	0.000000		o
T3	3		70	776.03	68.58	0.000000	0.207036	

Weight of Breast muscles with skin at 49 days (both sexes together)

Treatment	Treat. No.	No. of measurement	Average	Standard deviation	Scheffe test		
			(g)		T1	T2	T3
T1	1	275	852.43	88.52		***	***
T2	2	207	755.35	92.85	0.000000		***
T3	3	210	819.55	95.33	0.000535	0.000000	

Weight of Thigh muscles with skin at 49 days (by sex)

Tab. No. 8b

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♂	138	641.01	44.34		***	***
T2	2		137	595.43	56.38	0.000000		**
T3	3		140	571.66	52.67	0.000000	0.005785	

Treatment	Treat. No.	Sex	No. of measurement	Average	Standard deviation	Scheffe test		
				(g)		T1	T2	T3
T1	1	♀	137	602.73	55.21		***	***
T2	2		70	568.50	58.95	0.000250		**
T3	3		70	534.66	55.89	0.000000	0.002086	

Weight of Thigh muscles with skin at 49 days (both sexes together)

Treatment	Treat. No.	No. of measurement	Average	Standard deviation	Scheffe test		
			(g)		T1	T2	T3
T1	1	275	621.94	53.51		***	***
T2	2	207	586.32	58.53	0.000000		***
T3	3	210	559.32	56.41	0.000000	0.000007	

Performance results per pen

Body weight per phases

Tab. No. 9a

Treatment	Tr. no.	Pen	Sex	Day 1		Day 21		Day 28		Day 35		Day 42		Day 49	
				Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight
					g		g		g		g				
T1	1	1	+0	70	59.43	70	1574.63	70	2220.41	69	3005.09	69	3509.64	69	3855.42
				7	59.43	70	1559.97	69	2207.48	68	3109.59	68	3518.41	68	3808.88
				13	60.14	70	1516.07	69	2245.49	69	3127.45	69	3489.48		
		16	♂	4	60.57	70	1606.53	70	2252.70	70	3217.51	70	3719.23	70	4145.49
				10	59.71	70	1578.87	70	2295.26	69	3156.80	69	3679.22	68	4173.13
				16	59.86	70	1554.09	70	2243.03	70	3129.53	70	3576.66		
T2	2	2	+0	70	53.14	70	1510.37	69	2155.13	68	3050.72	68	3499.99	68	3737.82
				8	53.43	70	1478.27	70	2136.57	70	3038.29	70	3319.17	70	3700.54
				14	52.71	70	1457.26	70	2181.80	70	2952.61	70	3318.13		
				20	52.86	70	1487.94	70	2175.30	70	2959.03	70	3309.11		
		23	♂	5	52.86	70	1514.10	70	2126.63	70	2941.24	69	3508.07	69	3904.43
				11	54.00	70	1479.10	69	2173.51	69	2943.87	69	3490.57	68	3934.93
				17	52.71	70	1517.39	70	2187.77	70	3029.10	70	3473.27		
				23	53.14	70	1498.96	70	2139.99	70	2988.14	70	3420.84		
T3	3	3	+0	70	58.29	70	1525.13	70	2192.31	69	3056.46	69	3404.97	69	3629.51
				9	60.29	70	1479.31	70	2162.60	70	2938.74	70	3390.80	70	3626.91
				15	59.14	69	1490.39	67	2213.48	67	2976.79	67	3287.88		
				21	59.71	70	1546.40	69	2200.25	69	3102.32	69	3575.36		
		24	♂	6	58.57	70	1553.27	70	2192.29	70	3164.47	70	3635.41	70	3957.19
				12	60.57	70	1555.06	70	2219.11	70	3136.49	70	3526.91	70	3930.41
				18	59.14	70	1523.20	70	2215.10	70	3115.29	70	3558.37		
				24	58.86	70	1494.96	70	2171.73	70	3037.49	69	3370.35		

Weight gain per phases

Tab. No. 9b

Treat.	Tr. no.	Pen	Sex	Day 1 - 21		Day 22 - 28		Day 29 - 35		Day 36 - 42		Day 43 - 49		Day 1 - 49 (42*)	
				Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain	Weight gain per phase	Daily weight gain
				g	g	g	g	g	g	g	g	g	g	g	g
T1	1	1	♀	1515.20	72.15	645.79	92.26	784.67	112.10	504.55	72.08	345.78	49.40	3795.99	77.47
		7		1500.54	71.45	647.51	92.50	902.11	128.87	408.82	58.40	290.47	41.50	3749.45	76.52
		13		1455.93	69.33	729.42	104.20	881.96	125.99	362.03	51.72			3429.34*	81.65*
		4	♂	1545.96	73.62	646.17	92.31	964.81	137.83	501.71	71.67	426.26	60.89	4084.91	83.37
		10		1519.16	72.34	716.39	102.34	861.54	123.08	522.42	74.63	493.91	70.56	4113.42	83.95
		16		1494.23	71.15	688.94	98.42	886.50	126.64	447.13	63.88			3516.80*	83.73*
T2	2	2	♀	1457.23	69.39	644.76	92.11	895.59	127.94	449.26	64.18	237.84	33.98	3684.68	75.20
		8		1424.84	67.85	658.30	94.04	901.71	128.82	280.89	40.13	381.37	54.48	3647.11	74.43
		14		1404.54	66.88	724.54	103.51	770.81	110.12	365.51	52.22			3265.41*	77.75*
		20		1435.09	68.34	687.36	98.19	783.73	111.96	350.09	50.01			3256.26*	77.53*
		5	♂	1461.24	69.58	612.53	87.50	814.61	116.37	566.83	80.98	396.36	56.62	3851.58	78.60
		11		1425.10	67.86	694.41	99.20	770.36	110.05	546.70	78.10	444.36	63.48	3880.93	79.20
		17		1464.67	69.75	670.39	95.77	841.33	120.19	444.17	63.45			3420.56*	81.44*
		23		1445.81	68.85	641.03	91.58	848.16	121.17	432.70	61.81			3367.70*	80.18*
T3	3	3	♀	1466.84	69.85	667.19	95.31	864.15	123.45	348.51	49.79	224.54	32.08	3571.22	72.88
		9		1419.03	67.57	683.29	97.61	776.14	110.88	452.06	64.58	236.11	33.73	3566.63	72.79
		15		1431.25	68.15	723.09	103.30	763.31	109.04	311.09	44.44			3228.74*	76.87*
		21		1486.69	70.79	653.85	93.41	902.07	128.87	473.04	67.58			3515.65*	83.71*
		6	♂	1494.70	71.18	639.01	91.29	972.19	138.88	470.94	67.28	321.77	45.97	3898.61	79.56
		12		1494.49	71.17	664.06	94.87	917.37	131.05	390.43	55.78	403.50	57.64	3869.84	78.98
		18		1464.06	69.72	691.90	98.84	900.19	128.60	443.09	63.30			3499.23*	83.31*
		24		1436.10	68.39	676.77	96.68	865.76	123.68	332.86	47.55			3311.49*	78.85*

Feed conversion ratio (Feed consumption per 1 kg of live weight)

Tab. No. 9c

Treatment	Tr. no.	Pen	Sex	Feed conversion ratio				
				Day 21	Day 28	Day 35	Day 42	Day 49
				g/kg LW	g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1		1	♀	1310.06	1574.35	1809.49	2154.32	2474.96
		7		1362.66	1629.51	1746.97	2181.80	2524.29
		13		1394.58	1599.98	1754.91	2231.97	
		4	♂	1306.28	1569.55	1693.85	2086.45	2402.61
		10		1345.45	1510.57	1708.30	2091.65	2395.93
		16		1329.22	1565.49	1699.94	2093.34	
T2		2	♀	1392.28	1626.72	1754.17	2187.40	2570.31
		8		1397.38	1628.78	1748.64	2248.41	2573.75
		14		1409.69	1619.89	1853.56	2310.25	
		20		1404.62	1588.62	1758.30	2199.12	
		5	♂	1360.54	1618.26	1770.39	2052.82	2391.93
		11		1428.47	1620.97	1817.58	2118.34	2414.28
		17		1377.37	1580.87	1734.13	2142.07	
		23		1370.48	1604.15	1727.78	2154.86	
T3		3	♀	1387.24	1576.94	1728.34	2131.58	2502.44
		9		1396.40	1599.27	1812.24	2163.00	2562.98
		15		1396.38	1607.52	1800.50	2228.45	
		21		1333.05	1582.17	1673.36	2050.67	
		6	♂	1365.78	1583.47	1645.05	1991.91	2332.47
		12		1335.73	1582.36	1688.42	2072.23	2372.34
		18		1377.74	1578.77	1678.36	2076.79	
		24		1383.70	1572.81	1721.35	2142.30	

Feed consumption per phases

Tab. No. 9d

Treatment	Tr. no.	Pen	Sex	Feed consumption					
				Starter (1-21 days)	Grower (22-28 days)	Grower (29-35 days)	Finisher (36-42 days)	Finisher (43-49 days)	Total
				kg	kg	kg	kg	kg	kg
T1	1	1	♀	144.40	100.30	130.50	146.50	136.70	658.40
		7		148.80	99.40	121.20	152.60	131.80	653.80
		13		148.00	99.90	130.80	158.70		537.40
		4	♂	146.90	100.60	134.00	161.70	154.00	697.20
		10		148.70	94.00	129.40	158.90	148.90	679.90
		16		144.60	101.20	126.60	151.70		524.10
T2	2	2	♀	147.20	94.70	122.00	156.70	132.70	653.30
		8		144.60	99.00	128.30	150.50	144.30	666.70
		14		143.80	103.60	135.70	153.50		536.60
		20		146.30	95.60	122.30	145.20		509.40
		5	♂	144.20	96.70	123.60	132.40	147.50	644.40
		11		147.90	95.20	126.10	141.00	135.80	646.00
		17		146.30	95.80	125.60	153.10		520.80
		23		143.80	96.50	121.10	154.60		516.00
T3	3	3	♀	148.10	93.90	122.50	136.30	125.90	626.70
		9		144.60	97.50	130.70	140.60	137.30	650.70
		15		143.60	94.80	120.70	131.80		490.90
		21		144.30	95.90	118.00	147.70		505.90
		6	♂	148.50	94.50	121.40	142.50	139.20	646.10
		12		145.40	100.40	124.90	140.90	141.10	652.70
		18		146.90	97.90	121.20	151.30		517.30
		24		144.80	94.30	126.90	132.20		498.20