



MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE ÚSTRAŠICE

státní podnik

390 02 Tábor 2

Česká republika

BROILER FEEDING TEST No. 4/2023

Effect of feed additives to performance of broilers

XXXXX

21 March 2023 – 25 April 2023

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Basic tests information

The basic dates

Beginning of the test: 27 February 2023 (setting in the incubator)
21 March 2023 (transfer to the chicken house)
End of the test: 25 April 2023

Material and methods

Material

In total there were 2240 day old chicks of xxxxx. Day old chicks were randomly distributed into 5 dietary treatments.

Experimental treatments

Treat. No.	Treat.	Description	No. of pen	Birds per pen	No. of chick
1	T1	xxxxx	6	70	420
2	T2	xxxxx	7	70	490
3	T3	xxxxx	7	70	490
4	T4	xxxxx	6	70	420
5	T5	xxxxx	6	70	420

Origin of hatching eggs: Mezinárodní testování drůbeže s.p., Ústrašice, age of the breeding flock was 49 weeks.

Housing system

Chickens were kept in the windowless chicken house with full climatic control, on deep litter. Drinking water was supplied ad libitum by nipple drinkers. Each pen was equipped with manually filled tube feeders. Bedding material was wood shaving.

Lighting programme

Day 1 - 7 23 hours of light + 1 hour of darkness
Day 8 - 32 18 hours of light + 6 hours of darkness
Day 33 - 35 23 hours of light + 1 hour of darkness

Stocking density

16,3 broilers per square meter.

Feed

Feed was produced in Mezinárodní testování drůbeže s.p., Ústrašice.

Day 1 – 14 Starter (BR1)

Day 15 – 28 Grower (BR2)

Day 29 – 35 Finisher (BR3)

Diet formulas

Components (%)	Starter BR1	Grower BR2	Finisher BR3
Soybean meal	37.00	32.00	29.00
Wheat	34.50	38.00	39.00
Maize	20.00	20.54	22.00
Soybean oil	4.40	5.50	6.20
Limestone	1.52	1.35	1.18
MCP	1.10	1.10	1.09
Salt	0.29	0.29	0.29
Na ₂ CO ₃	0.12	0.15	0.15
L-lysine HCl	0.30	0.28	0.26
L-threonine	0.20	0.15	0.20
DL-methionine	0.069	0.136	0.126
Premix AMVBR1 Plus	0.50	-	-
Premix AMVBR2 Plus	-	0.50	-
Premix AMVBR3 Plus	-	-	0.50
Nutrient content			
Crude protein (g/kg)	223.33	205.95	194.43
ME (MJ/kg)	12.11	12.52	12.79
Lysine (g/kg)	14.36	12.91	11.97
Methionine (g/kg)	6.15	6.18	5.63
Met.+Cys. (g/kg)	10.00	9.77	9.07
Ca (g/kg)	9.60	8.72	7.90
P dig. (g/kg)	3.34	3.33	3.30
Na (g/kg)	1.53	1.61	1.61

Veterinary precautions

The chicken house was disinfected by xxxxx before the chick placement. On days 1 chickens were vaccinated with xxxxxx.

Parameters recorded

Live weight

Live weight was measured on days 1 (all the birds in each pen were weighed altogether), 14 and 28 (all the birds were weighed individually, without fasting). On day 35 birds were weighed individually, after 12 hours of fasting.

Weight gain

Weight gain per phase and average daily weight gains were calculated for the periods 1 – 14 days, 15 – 28 days, 29 – 35 days and for the overall experiment (1 – 35 days).

Feed conversion ratio

Feed consumption and feed conversion ratio to gain ratio were calculated for the periods 1 – 14 days, 15 – 28 days, 29 – 35 days and for the overall experiment (1 – 35 days). The calculation was included weight of deaths.

Feed consumption

Feed consumption was measured per pen for the feed – starter, grower and finisher.

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. Mortality was recorded for the periods 1 – 14 days, 15 – 28 days, 29 – 35 days and 1 – 35 days.

Carcass analysis

The carcass analysis was done in 10 birds per each pen (5 ♂ and 5 ♀) on day 35. Breast muscles was weighed without skin and thigh muscles with skin.

Foot pad lesions

At the end of the trial the animals were recorded according the scale.

Statistical analyses

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

Results

Tab. No.	1 Hatchability
	2 Performance results:
	2a Body weight
	2b Weight gain
	2c Feed conversion ratio per 1 kg of live weight
	2d Feed consumption per 1 kg of weight gain
	2e Feed consumption
	3 Mortality
	4 Carcass analysis
	5 Foot pad lesions
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	(average body weight, standard deviation, coefficient of variation)
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	13a Body weight
	13b Weight gain
	13c Feed conversion ratio per 1 kg of live weight
	13d Feed consumption per 1 kg of weight gain
	13e Feed consumption
	13f Foot pad lesions

Results of incubation and hatching

Tab. No. 1

Treatment	Tr. No.	Fertility	Hatchability		Birds housed	Average weight	
			Set eggs	Fertile eggs		Hatching eggs	Day old chicks
		%	%	%		g	g
T1	1	95.30	88.20	92.55	420	66.53	45.42
T2	2				490		44.86
T3	3				490		44.94
T4	4				420		45.08
T5	5				420		45.60

Body weight per phases

Tab. No. 2a

Treatment	Tr. No.	Day 1		Day 14		Day 28		Day 35	
		Birds	Average body weight	Birds	Average body weight	Birds	Average body weight	Birds	Average body weight
			g		g		g		g
T1	1	420	45.42	418	381.36	396	1176.79	381	1721.72
T2	2	490	44.86	481	322.60	451	1047.79	398	1638.40
T3	3	490	44.94	480	324.21	453	1055.75	397	1631.05
T4	4	420	45.08	415	343.73	396	1081.83	356	1659.83
T5	5	420	45.60	417	330.63	394	1083.89	347	1672.62

Weight gain per phases

Tab. No. 2b

Treatment	Tr. No.	Day 1 - 14		Day 15 - 28		Day 29 - 35		Day 1 - 35	
		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
T1	1	335.94	24.00	795.43	56.82	544.93	77.85	1676.30	47.89
T2	2	277.74	19.84	725.19	51.80	590.61	84.37	1593.54	45.53
T3	3	279.27	19.95	731.54	52.25	575.29	82.18	1586.11	45.32
T4	4	298.65	21.33	738.10	52.72	578.00	82.57	1614.75	46.14
T5	5	285.03	20.36	753.26	53.80	588.73	84.10	1627.02	46.49

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

Tab. No. 2c

Treatment	Tr. No.	Feed conversion ratio		
		Day 14	Day 28	Day 35
		g/kg LW	g/kg LW	g/kg LW
T1	1	1095.98	1476.10	1537.73
T2	2	1122.75	1455.74	1492.88
T3	3	1147.34	1390.74	1481.14
T4	4	1112.45	1600.94	1593.62
T5	5	1162.72	1485.08	1517.58

Feed consumption per 1 kg of weight gain (WG)**Tab. No. 2d**

Treatment	Tr. No.	Feed consumption per 1 kg of weight gain			
		1-14 days	15-28 days	29-35 days	1-35 days
		g/kg WG	g/kg WG	g/kg WG	g/kg WG
T1	1	1244.38	1665.38	1682.87	1581.75
T2	2	1304.46	1612.82	1572.77	1539.81
T3	3	1332.35	1505.83	1672.58	1528.32
T4	4	1280.71	1837.70	1577.75	1641.80
T5	5	1348.87	1632.65	1590.17	1564.41

Feed consumption per phases**Tab. No. 2e**

Treatment	Tr. No.	Feed consumption			
		Starter (1-14 days)	Grower (15-28 days)	Finisher (29-35 days)	Total
		kg	kg	kg	kg
T1	1	175.31	534.99	343.87	1054.17
T2	2	177.17	539.48	360.02	1076.67
T3	3	181.94	505.04	369.42	1056.40
T4	4	160.31	546.40	321.46	1028.17
T5	5	161.36	494.94	314.64	970.94

Results of carcass analysis

Tab. No. 4

Treatment	Tr. No.	Sex	Weight				Ratio of abd. fat to live weight	Breast muscles without skin			Thigh muscles with skin			Total muscles			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	♂	1870	1237	123	17	0.90	403	21.57	32.60	378	20.22	30.56	781	41.79	63.15	66.17	72.73
		♀	1610	1081	110	14	0.89	347	21.55	32.10	327	20.31	30.26	674	41.86	62.35	67.13	73.96
		♂	1740	1159	116	16	0.89	375	21.56	32.36	353	20.26	30.42	728	41.82	62.78	66.62	73.30
T2	2	♂	1843	1202	119	15	0.79	389	21.10	32.36	364	19.73	30.26	753	40.83	62.61	65.21	71.68
		♀	1617	1077	108	15	0.92	341	21.07	31.64	329	20.34	30.55	670	41.41	62.18	66.60	73.25
		♂	1730	1139	114	15	0.85	365	21.08	32.02	346	20.02	30.39	711	41.10	62.41	65.86	72.42
T3	3	♂	1864	1229	121	15	0.78	401	21.51	32.63	372	19.95	30.25	773	41.46	62.88	65.93	72.41
		♀	1628	1085	112	14	0.85	354	21.72	32.61	326	20.03	30.07	680	41.75	62.67	66.61	73.47
		♂	1746	1157	116	14	0.81	377	21.61	32.62	349	19.98	30.16	726	41.59	62.78	66.25	72.91
T4	4	♂	1849	1243	121	15	0.80	407	21.99	32.72	378	20.45	30.43	785	42.44	63.15	67.20	73.72
		♀	1613	1075	109	13	0.80	351	21.76	32.65	330	20.45	30.69	681	42.21	63.35	66.64	73.42
		♂	1731	1159	115	14	0.80	379	21.88	32.69	354	20.45	30.55	733	42.33	63.24	66.94	73.58
T5	5	♂	1878	1255	122	16	0.84	414	22.02	32.96	378	20.11	30.10	791	42.13	63.06	66.80	73.30
		♀	1657	1102	113	14	0.84	360	21.70	32.62	334	20.15	30.29	693	41.85	62.91	66.53	73.35
		♂	1768	1179	118	15	0.84	387	21.87	32.80	356	20.13	30.19	742	42.00	62.99	66.68	73.32

Foot pad lesions**Tab. No. 5**

Treatment	Tr. No.	Evaluation	
		right foot	left foot
T1	1	2.89	2.91
T2	2	2.48	2.47
T3	3	2.65	2.65
T4	4	2.93	2.92
T5	5	2.54	2.55

Statistical analysis - Body weight at 35 days of age

Tab. No. 6

Treatment	Tr. No.	Cocks				Hens			
		Number of birds	Average body weight	Standard deviation	Coefficient of variation	Number of birds	Average body weight	Standard deviation	Coefficient of variation
			g/birds	g/birds	%		g/birds	g/birds	%
T1	1	186	1838.57	232.29	12.63	195	1610.26	214.77	13.34
T2	2	187	1767.08	233.62	13.22	211	1524.35	247.33	16.23
T3	3	174	1769.22	201.69	11.40	223	1523.23	220.89	14.50
T4	4	141	1822.21	239.51	13.14	215	1553.34	213.80	13.76
T5	5	156	1790.19	229.78	12.84	191	1576.60	250.48	15.89

Statistical analyses of performance results

Performance results were statistically evaluated using the ANOVA single-factor model (Scheffe test) or nonparametric method Kruskal - Wallis 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

Body weight - day 1

Tab. No. 7a

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	45.42	0.58		o	o	o	o
T2	2	7	44.86	0.64	0.767852		o	o	o
T3	3	7	44.94	0.64	0.853578	0.999772		o	o
T4	4	6	45.09	1.10	0.961803	0.989207	0.998033		o
T5	5	6	45.60	0.69	0.996334	0.541729	0.648163	0.840818	

Body weight - day 14

Tab. No. 7b

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	418	381.36	59.47		***	***	***	***
T2	2	481	322.60	53.80	0.000000		o	***	o
T3	3	480	324.21	57.25	0.000000	0.996024		***	o
T4	4	415	343.73	59.18	0.000000	0.000007	0.000054		*
T5	5	417	330.63	62.14	0.000000	0.374285	0.607721	0.033020	

Body weight - day 28

Tab. No. 7c

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	396	1176.79	197.19		***	***	***	***
T2	2	451	1047.79	182.65	0.000000		o	o	o
T3	3	453	1055.75	179.59	0.000000	0.980655		o	o
T4	4	396	1081.83	177.46	0.000000	0.126607	0.376213		o
T5	5	394	1083.89	184.96	0.000000	0.089555	0.296824	0.999924	

Body weight - day 35

Tab. No. 7d

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	381	1721.72	250.75		***	***	*	o
T2	2	398	1638.40	269.52	0.000447		o	o	o
T3	3	397	1631.05	245.07	0.000083	0.996900		o	o
T4	4	356	1659.83	259.84	0.031642	0.861423	0.673362		o
T5	5	347	1672.62	263.49	0.159771	0.514129	0.306914	0.979695	

Average weight gain (day 1-14)

Tab. No. 8a

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	23.99	1.89		o	o	o	o
T2	2	7	19.82	1.72	0.072382		o	o	o
T3	3	7	19.95	2.49	0.086830	0.999987		o	o
T4	4	6	21.34	2.95	0.471527	0.861109	0.895079		o
T5	5	6	20.35	2.82	0.174828	0.996959	0.998979	0.971290	

Average weight gain (day 15-28)

Tab. No. 8b

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	56.85	4.10		o	o	o	o
T2	2	7	51.81	2.68	0.138348		o	o	o
T3	3	7	52.32	3.45	0.218457	0.999089		o	o
T4	4	6	52.75	3.55	0.345228	0.991506	0.999590		o
T5	5	6	53.81	2.41	0.633954	0.876640	0.953991	0.988539	

Average weight gain (day 29-35)

Tab. No. 8c

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	77.54	12.87		o	o	o	o
T2	2	7	84.31	9.04	0.826705		o	o	o
T3	3	7	81.98	5.65	0.956684	0.995473		o	o
T4	4	6	83.72	12.52	0.883158	0.999983	0.998746		o
T5	5	6	83.90	8.91	0.872193	0.999996	0.998167	1.000000	

Average weight gain (day 1-35)

Tab. No. 8d

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	47.84	2.19		o	o	o	o
T2	2	7	45.52	2.08	0.562616		o	o	o
T3	3	7	45.30	1.69	0.477658	0.999903		o	o
T4	4	6	46.38	2.94	0.889945	0.979994	0.955894		o
T5	5	6	46.44	3.03	0.904280	0.974258	0.946414	0.999999	

FCR 14**Tab. No. 9a**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1095.60	114.58		o	o	o	o
T2	2	7	1122.82	96.11	0.993906		o	o	o
T3	3	7	1141.91	106.38	0.956323	0.998202		o	o
T4	4	6	1111.84	28.02	0.999296	0.999827	0.991091		o
T5	5	6	1166.23	140.01	0.843561	0.965312	0.996052	0.932884	

FCR 28**Tab. No. 9b**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1485.42	224.00		o	o	o	o
T2	2	7	1453.35	177.83	0.999219		o	o	o
T3	3	7	1389.92	169.96	0.951053	0.987244		o	o
T4	4	6	1602.72	156.65	0.913004	0.793010	0.505130		o
T5	5	6	1488.00	290.79	1.000000	0.998941	0.946282	0.919216	

FCR 35**Tab. No. 9c**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1546.16	189.60		o	o	o	o
T2	2	7	1491.41	157.70	0.987351		o	o	o
T3	3	7	1479.94	119.95	0.974406	0.999968		o	o
T4	4	6	1593.36	161.39	0.993741	0.886388	0.841493		o
T5	5	6	1518.37	225.95	0.999205	0.999184	0.996733	0.964894	

FCR per 1 kg of weight gain - 1-14 day

Tab. No. 10a

Treatment	Treat. No.	No. of box	Average (g/kg weight gain)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1244.68	131.03		o	o	o	o
T2	2	7	1305.81	114.89	0.932563		o	o	o
T3	3	7	1327.16	113.78	0.823767	0.998467		o	o
T4	4	6	1282.33	36.12	0.989823	0.998095	0.977585		o
T5	5	6	1355.82	170.53	0.642694	0.966646	0.995865	0.890135	

FCR per 1 kg of weight gain - 15-28 day

Tab. No. 10b

Treatment	Treat. No.	No. of box	Average (g/kg weight gain)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1679.00	312.79		o	o	o	o
T2	2	7	1607.52	259.79	0.995018		o	o	o
T3	3	7	1505.13	219.92	0.877999	0.977538		o	o
T4	4	6	1844.65	242.46	0.907468	0.700261	0.363937		o
T5	5	6	1637.60	387.16	0.999491	0.999834	0.950933	0.814108	

FCR per 1 kg of weight gain - 29-35 day

Tab. No. 10c

Treatment	Treat. No.	No. of box	Average (g/kg weight gain)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1726.36	268.09		o	o	o	o
T2	2	7	1580.29	193.09	0.796946		o	o	o
T3	3	7	1673.05	166.03	0.993990	0.946308		o	o
T4	4	6	1576.92	251.74	0.805180	1.000000	0.947124		o
T5	5	6	1594.93	108.12	0.867908	0.999963	0.974791	0.999927	

FCR per 1 kg of weight gain - 1-35 day

Tab. No. 10d

Treatment	Treat. No.	No. of box	Average (g/kg weight gain)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1590.78	197.19		o	o	o	o
T2	2	7	1538.29	161.87	0.990450		o	o	o
T3	3	7	1527.18	123.27	0.980406	0.999975		o	o
T4	4	6	1641.61	166.80	0.992662	0.893148	0.852514		o
T5	5	6	1565.43	233.45	0.999513	0.999262	0.997170	0.966946	

Ratio of abd. fat to live weight - ♂**Tab. No. 11a**

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	0.90	0.18		o	o	o	o
T2	2	7	0.79	0.07	0.781953		o	o	o
T3	3	7	0.78	0.11	0.706847	0.999917		o	o
T4	4	6	0.79	0.19	0.800690	1.000000	0.999942		o
T5	5	6	0.84	0.13	0.970215	0.987326	0.969779	0.988418	

Breast muscles % total weight - ♂**Tab. No. 11b**

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	21.51	1.45		o	o	o	o
T2	2	7	21.09	0.84	0.968130		o	o	o
T3	3	7	21.52	0.98	1.000000	0.957114		o	o
T4	4	6	21.98	0.75	0.955875	0.655316	0.956259		o
T5	5	6	21.98	1.00	0.956062	0.655855	0.956452	1.000000	

Breast muscles % body carcass - ♂**Tab. No. 11c**

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	32.51	1.73		o	o	o	o
T2	2	7	32.32	0.74	0.999080		o	o	o
T3	3	7	32.62	1.07	0.999903	0.993829		o	o
T4	4	6	32.71	1.15	0.999211	0.986663	0.999967		o
T5	5	6	32.92	1.23	0.986181	0.935496	0.995212	0.998863	

Thigh muscles % total weight - ♂**Tab. No. 11d**

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	20.22	0.70		o	o	o	o
T2	2	7	19.74	0.72	0.784581		o	o	o
T3	3	7	19.96	0.68	0.972402	0.981456		o	o
T4	4	6	20.47	0.71	0.977048	0.419689	0.742170		o
T5	5	6	20.10	0.38	0.998578	0.913845	0.997630	0.908687	

Thigh muscles % body carcass - ♂**Tab. No. 11e**

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	30.59	1.05		o	o	o	o
T2	2	7	30.25	0.39	0.943068		o	o	o
T3	3	7	30.26	0.59	0.946024	1.000000		o	o
T4	4	6	30.46	0.85	0.998373	0.991325	0.992138		o
T5	5	6	30.11	0.47	0.833890	0.997283	0.996900	0.942682	

Total muscles % total weight - ♂

Tab. No. 11f

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	41.73	1.42		o	o	o	o
T2	2	7	40.83	1.43	0.798209		o	o	o
T3	3	7	41.49	1.38	0.998258	0.912707		o	o
T4	4	6	42.46	0.85	0.905176	0.275406	0.750137		o
T5	5	6	42.08	1.01	0.993093	0.535368	0.947158	0.991187	

Total muscles % body carcass - ♂

Tab. No. 11g

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	63.10	0.96		o	o	o	o
T2	2	7	62.57	0.65	0.869061		o	o	o
T3	3	7	62.88	0.90	0.994273	0.976474		o	o
T4	4	6	63.16	0.95	0.999974	0.819808	0.986043		o
T5	5	6	63.03	0.82	0.999916	0.922250	0.998962	0.999232	

Ratio of abd. fat to live weight - ♀

Tab. No. 12a

Treatment	Treat. No.	No. of box	%	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	6	0.89	0.26		o	o	o	o
T2	2	7	0.92	0.23	1.000000		o	o	o
T3	3	7	0.85	0.17	1.000000	1.000000		o	o
T4	4	6	0.80	0.11	1.000000	1.000000	1.000000		o
T5	5	6	0.84	0.12	1.000000	1.000000	1.000000	1.000000	

Breast muscles % total weight - ♀

Tab. No. 12b

Treatment	Treat. No.	No. of box	%	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	6	21.52	1.40		o	o	o	o
T2	2	7	21.08	0.47	1.000000		o	o	o
T3	3	7	21.72	0.34	1.000000	0.461182		o	o
T4	4	6	21.77	0.59	1.000000	0.905492	1.000000		o
T5	5	6	21.72	0.78	1.000000	1.000000	1.000000	1.000000	

Breast muscles % body carcass - ♀

Tab. No. 12c

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	32.04	1.39		o	o	o	o
T2	2	7	31.63	0.53	0.949430		o	o	o
T3	3	7	32.60	0.54	0.860650	0.398935		o	o
T4	4	6	32.67	0.90	0.829346	0.377969	0.999969		o
T5	5	6	32.64	0.89	0.846521	0.398998	0.999994	1.000000	

Thigh muscles % total weight - ♀

Tab. No. 12d

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	20.32	0.43		o	o	o	o
T2	2	7	20.36	0.82	0.999974		o	o	o
T3	3	7	20.03	0.71	0.969592	0.940327		o	o
T4	4	6	20.46	0.85	0.998316	0.999611	0.882317		o
T5	5	6	20.14	0.64	0.995311	0.987059	0.999329	0.960660	

Thigh muscles % body carcass - ♀

Tab. No. 12e

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	30.27	0.47		o	o	o	o
T2	2	7	30.55	0.66	0.973399		o	o	o
T3	3	7	30.06	0.59	0.990331	0.799740		o	o
T4	4	6	30.69	1.11	0.900952	0.997857	0.643708		o
T5	5	6	30.26	0.59	1.000000	0.968724	0.992356	0.890933	

Total muscles % total weight - ♀

Tab. No. 12f

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2		T3	T4
T1	1	6	41.84	1.72		o	o	o	o
T2	2	7	41.44	1.16	0.983560		o	o	o
T3	3	7	41.75	0.93	0.999941	0.993112		o	o
T4	4	6	42.22	0.78	0.988379	0.837853	0.969550		o
T5	5	6	41.86	1.14	1.000000	0.980944	0.999889	0.990154	

Total muscles % body carcass - ♀

Tab. No. 12g

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2		T3	T4
T1	1	6	62.32	1.20		o	o	o	o
T2	2	7	62.18	0.65	0.998998		o	o	o
T3	3	7	62.67	0.61	0.963593	0.873150		o	o
T4	4	6	63.36	0.79	0.335376	0.191687	0.687916		o
T5	5	6	62.91	0.81	0.820399	0.650916	0.991222	0.920902	

Body weight (BW) per box

Tab. No. 13a

Treatment	Tr. No.	Box No.	Day 1		Day 14		Day 28		Day 35	
			Birds	BW	Birds	BW	Birds	BW	Birds	BW
				g		g		g		g
T1	1	1	70	44.94	70	415.10	66	1172.05	66	1853.55
		6	70	45.57	69	353.93	66	1098.35	61	1697.36
		11	70	46.14	70	407.51	64	1267.81	60	1684.87
		16	70	45.86	70	384.60	67	1261.93	67	1766.24
		21	70	45.43	69	351.48	67	1118.27	65	1659.46
		26	70	44.57	70	374.71	66	1144.71	62	1658.18
T2	2	2	70	45.14	70	367.54	67	1049.12	59	1710.97
		7	70	45.43	69	330.97	67	1058.25	61	1625.49
		12	70	45.07	69	312.36	63	1086.16	60	1712.70
		17	70	45.50	68	288.56	63	1052.21	57	1656.47
		22	70	43.93	70	317.44	65	1057.71	56	1551.23
		27	70	44.93	70	326.31	65	1002.91	56	1530.50
T3	3	3	70	45.43	69	400.75	64	1079.59	61	1721.75
		8	70	45.57	69	317.09	67	1022.07	64	1556.02
		13	70	45.50	64	316.39	61	1136.02	59	1675.78
		18	70	44.57	70	298.33	65	1056.60	54	1647.00
		23	70	45.21	69	324.80	68	1050.13	59	1587.58
		28	70	44.29	70	298.23	65	988.57	48	1578.98
T4	4	4	70	44.86	69	423.72	69	1091.81	66	1623.02
		9	70	46.79	68	331.97	64	1082.78	58	1673.74
		14	70	45.50	70	337.17	67	1126.30	63	1598.79
		19	70	44.36	69	332.46	62	1126.87	49	1851.76
		24	70	45.43	70	303.26	67	1003.28	64	1563.69
		29	70	43.57	69	334.28	67	1063.03	56	1699.43
T5	5	5	70	46.57	70	410.41	66	1159.50	64	1829.53
		10	70	45.50	69	308.26	65	1011.69	59	1526.81
		15	70	45.29	70	309.06	66	1080.27	57	1707.65
		20	70	45.79	68	307.90	64	1102.61	52	1728.71
		25	70	45.93	70	324.47	67	1098.79	60	1629.08
		30	70	44.50	70	322.71	66	1049.74	55	1604.62

Weight gain (WG) and daily weight gain (DWG) per box

Tab. No. 13b

Treatment	Tr. No.	Box No.	Day 1 - 14		Day 15 - 28		Day 29 - 35		Day 1 - 35	
			WG	DWG	WG	DWG	WG	DWG	WG	DWG
			g	g	g	g	g	g	g	g
T1	1	1	370.16	26.44	756.95	54.07	681.50	97.36	1808.61	51.67
		6	308.36	22.03	744.42	53.17	599.01	85.57	1651.79	47.19
		11	361.37	25.81	860.30	61.45	417.05	59.58	1638.73	46.82
		16	338.74	24.20	877.33	62.67	504.31	72.04	1720.38	49.15
		21	306.05	21.86	766.79	54.77	541.19	77.31	1614.03	46.12
		26	330.14	23.58	770.00	55.00	513.47	73.35	1613.61	46.10
T2	2	2	322.40	23.03	681.58	48.68	661.85	94.55	1665.83	47.60
		7	285.54	20.40	727.28	51.95	567.24	81.03	1580.06	45.14
		12	267.29	19.09	773.80	55.27	626.54	89.51	1667.63	47.65
		17	243.06	17.36	763.65	54.55	604.27	86.32	1610.97	46.03
		22	273.51	19.54	740.26	52.88	493.52	70.50	1507.30	43.07
		27	281.38	20.10	676.59	48.33	527.59	75.37	1485.57	42.44
T3	3	31	269.34	19.24	714.58	51.04	650.08	92.87	1634.00	46.69
		3	355.32	25.38	678.84	48.49	642.16	91.74	1676.32	47.89
		8	271.52	19.39	704.99	50.36	533.94	76.28	1510.45	43.16
		13	270.89	19.35	819.63	58.54	539.76	77.11	1630.28	46.58
		18	253.76	18.13	758.27	54.16	590.40	84.34	1602.43	45.78
		23	279.59	19.97	725.34	51.81	537.44	76.78	1542.37	44.07
T4	4	28	253.94	18.14	690.34	49.31	590.41	84.34	1534.69	43.85
		32	270.07	19.29	750.07	53.58	582.90	83.27	1603.04	45.80
		4	378.86	27.06	668.09	47.72	531.20	75.89	1578.16	45.09
		9	285.18	20.37	750.81	53.63	590.96	84.42	1626.95	46.48
		14	291.67	20.83	789.13	56.37	472.50	67.50	1553.29	44.38
		19	288.10	20.58	794.41	56.74	724.88	103.55	1807.40	51.64
T5	5	24	257.83	18.42	700.03	50.00	560.40	80.06	1518.26	43.38
		29	290.71	20.76	728.75	52.05	636.40	90.91	1655.86	47.31
		5	363.84	25.99	749.09	53.51	670.03	95.72	1782.96	50.94
		10	262.76	18.77	703.43	50.25	515.12	73.59	1481.31	42.32
		15	263.77	18.84	771.22	55.09	627.38	89.63	1662.36	47.50
		20	262.11	18.72	794.71	56.77	626.10	89.44	1682.92	48.08
T5	5	25	278.54	19.90	774.32	55.31	530.29	75.76	1583.15	45.23
		30	278.21	19.87	727.03	51.93	554.88	79.27	1560.12	44.57

Treatment	Tr. No.	Box No.	Feed conversion ratio		
			Day 14	Day 28	Day 35
			g/kg LW	g/kg LW	g/kg LW
T1	1	1	1165.30	1360.07	1359.07
		6	1278.67	1717.71	1742.44
		11	1093.04	1495.55	1631.80
		16	991.01	1103.54	1269.44
		21	969.31	1607.73	1583.43
		26	1076.25	1627.94	1690.77
T2	2	2	1226.29	1501.72	1585.05
		7	979.36	1322.49	1391.06
		12	1036.08	1678.13	1613.20
		17	1248.01	1366.67	1346.53
		22	1120.56	1685.31	1744.34
		27	1103.23	1217.14	1326.51
T3	3	31	1146.20	1401.98	1433.18
		3	1308.89	1509.10	1547.13
		8	976.58	1315.18	1419.08
		13	1115.09	1236.14	1369.62
		18	1179.91	1715.96	1674.54
		23	1149.48	1338.05	1544.69
T4	4	28	1203.30	1367.93	1479.11
		32	1060.12	1247.07	1325.40
		4	1139.25	1732.66	1783.72
		9	1082.46	1674.16	1622.20
		14	1084.65	1527.67	1579.16
		19	1111.78	1589.15	1467.92
T5	5	24	1150.37	1756.73	1746.01
		29	1102.50	1335.93	1361.13
		5	1115.95	1576.23	1552.66
		10	1368.86	1789.98	1790.44
		15	1306.74	1731.21	1705.62
		20	1008.27	1549.80	1544.66
T5	5	25	1116.54	1042.47	1190.71
		30	1081.01	1238.32	1326.10

Feed consumption per 1 kg of weight gain (WG) per box

Tab. No. 13d

Treatment	Tr. No.	Box No.	Feed consumption per 1 kg of weight gain			
			1-14 days	15-28 days	29-35 days	1-35 days
			g/kg WG	g/kg WG	g/kg WG	g/kg WG
T1	1	1	1306.77	1471.59	1357.30	1394.22
		6	1468.11	1935.26	1793.71	1794.19
		11	1232.60	1697.64	2131.86	1681.82
		16	1125.18	1154.10	1695.82	1304.15
		21	1113.88	1908.13	1530.70	1629.76
		26	1221.54	1907.30	1848.77	1740.56
T2	2	2	1397.98	1656.03	1747.47	1632.63
		7	1135.65	1482.65	1540.40	1434.11
		12	1211.27	1959.96	1489.30	1661.29
		17	1482.84	1415.16	1304.94	1389.54
		22	1300.54	1936.70	1902.25	1800.20
		27	1279.39	1274.21	1577.27	1370.36
		31	1333.02	1527.91	1500.37	1479.91
T3	3	3	1477.06	1636.27	1617.74	1592.92
		8	1140.80	1472.98	1632.06	1464.11
		13	1303.06	1288.48	1682.02	1412.72
		18	1387.15	1935.60	1575.93	1727.36
		23	1335.63	1424.31	2027.59	1593.51
		28	1413.17	1445.05	1662.07	1531.48
		32	1233.23	1333.19	1513.92	1368.19
T4	4	4	1274.78	2112.89	1893.47	1835.74
		9	1261.17	1953.30	1516.91	1673.09
		14	1253.86	1720.01	1715.43	1627.41
		19	1283.07	1805.40	1195.67	1511.45
		24	1353.07	2030.07	1725.62	1800.96
		29	1268.02	1446.26	1414.45	1400.99
T5	5	5	1258.78	1840.81	1508.47	1595.76
		10	1605.87	1982.23	1791.52	1850.12
		15	1531.11	1908.14	1650.17	1757.45
		20	1184.61	1771.01	1532.46	1593.04
		25	1300.65	1010.95	1549.88	1227.44
		30	1253.92	1312.46	1537.10	1368.80

Feed consumption per box

Tab. No. 13e

Treatment	Tr. No.	Box No.	Feed consumption			
			Starter (1-14 days)	Grower (15-28 days)	Finisher (29-35 days)	Total
			kg	kg	kg	kg
T1	1	1	33.86	74.68	61.05	169.59
		6	31.61	96.55	64.57	192.73
		11	31.18	96.45	49.57	177.20
		16	26.68	69.15	57.30	153.13
		21	23.75	99.36	54.02	177.13
		26	28.23	98.80	57.36	184.39
T2	2	2	31.55	76.05	64.23	171.83
		7	22.63	73.40	51.36	147.39
		12	22.60	97.40	55.81	175.81
		17	25.10	69.65	43.82	138.57
		22	24.90	96.68	51.30	172.88
		27	25.20	58.10	47.08	130.38
T3	3	31	25.19	68.20	46.42	139.81
		3	36.56	71.95	62.66	171.17
		8	21.64	70.04	55.50	147.18
		13	24.62	65.80	52.57	142.99
		18	24.64	98.65	47.56	170.85
		23	26.10	70.70	62.77	159.57
T4	4	28	25.12	64.40	44.60	134.12
		32	23.26	63.50	43.76	130.52
		4	33.65	97.40	66.62	197.67
		9	25.02	95.70	53.97	174.69
		14	25.60	93.50	50.54	169.64
		19	25.86	92.70	39.72	158.28
T5	5	24	24.42	95.60	61.96	181.98
		29	25.76	71.50	48.65	145.91
		5	32.06	92.00	63.33	187.39
		10	29.54	93.70	53.57	176.81
		15	28.27	99.04	56.02	183.33
		20	21.71	93.35	47.96	163.02
T5	5	25	25.36	53.94	48.66	127.96
		30	24.42	62.91	45.10	132.43

Foot pad lesions

Tab. No. 13f

Treatment	Tr. No.	Box	Evaluation	
			right foot	left foot
T1	1	1	2.86	2.85
		6	2.66	2.74
		11	2.55	2.53
		16	2.67	2.64
		21	3.40	3.37
		26	3.19	3.29
T2	2	2	2.39	2.34
		7	3.30	3.18
		12	1.28	1.28
		17	0.81	0.88
		22	3.34	3.41
		27	3.29	3.18
T3	3	31	3.12	3.20
		3	3.26	3.25
		8	2.75	2.69
		13	2.54	2.49
		18	1.46	1.44
		23	3.03	3.08
T4	4	28	2.94	2.92
		32	2.46	2.63
		4	3.33	3.24
		9	3.00	2.86
		14	2.89	2.86
		19	2.76	2.80
T5	5	24	3.06	3.06
		29	2.43	2.63
		5	3.45	3.45
		10	1.85	1.93
		15	0.98	1.00
		20	1.96	1.96
T5	5	25	3.28	3.28
		30	3.55	3.55