



MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE ÚSTRAŠICE

státní podnik

390 02 Tábor 2

Česká republika

BROILER FEEDING TEST No. 6/2022

Effect of feed additives to performance of broilers

XXXXX

22 March 2022 – 27 April 2022

Study Investigator:
Associate Investigator:

Ing. Jan Tyl
Ing. Jiří Fara
Ing. Markéta Krekulová

May 2022

Basic tests information

The basic dates

Beginning of the test: 1 March 2022 (setting in the incubator)
22 March 2022 (transfer to the chicken house)
End of the test: 27 April 2022

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 48 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	36.00	32.00	28.00
Wheat	35.00	38.04	41.80
Maize	20.56	20.58	20.17
Soybean oil	4.40	5.50	6.40
Limestone	1.47	1.35	1.17
MCP	1.10	1.10	1.00
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	0.06	0.06	0.06
Premix AMVBR1 Plus	0.50	-	-
Premix AMVBR2 Plus	-	0.50	-
Premix AMVBR3 Plus	-	-	0.50
Nutrient content			
Crude protein (g/kg)	223.43	208.29	193.54
ME (MJ/kg)	12.34	12.69	13.00
Lysine (g/kg)	14.10	12.91	11.73
Methionine (g/kg)	6.02	5.42	4.92
Met.+Cys. (g/kg)	9.82	9.02	8.33
Ca (g/kg)	9.55	8.94	7.91
P dig. (g/kg)	3.34	3.33	3.14
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 xxxxx.

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 6 birds per each pen (3 ♂ and 3 ♀) 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 of live weight 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
	6 Statistical analysis of body weight at the age of 35 days
	(average body weight, standard deviation, coefficient of variation)
	7 - 12 Statistical analyses of performance results
	13 Performance results per pen:
	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	93.40	85.10	90.91	420	67.00	45.02
T2	2				490		45.05
T3	3				490		44.88
T4	4				420		44.73
T5	5				420		45.25

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	45.02	420	527.69	417	1670.49	413	2376.63
T2	2	490	45.05	490	536.21	488	1730.60	484	2440.45
T3	3	490	44.88	490	537.11	487	1738.63	484	2435.00
T4	4	420	44.73	420	537.31	416	1695.71	413	2417.22
T5	5	420	45.25	420	535.53	420	1697.17	414	2419.53

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	482.67	34.48	1142.81	81.63	706.14	100.88	2331.61	66.62
T2	2	491.16	35.08	1194.40	85.31	709.85	101.41	2395.40	68.44
T3	3	492.23	35.16	1201.53	85.82	696.36	99.48	2390.12	68.29
T4	4	492.58	35.18	1158.40	82.74	721.50	103.07	2372.49	67.79
T5	5	490.28	35.02	1161.64	82.97	722.36	103.19	2374.28	67.84

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	1095.94	1470.79	1616.63
T2	2	1071.70	1412.04	1561.85
T3	3	1075.61	1402.09	1562.47
T4	4	1087.96	1439.04	1583.46
T5	5	1074.23	1436.58	1579.95

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	1198.16	1644.78	1952.25	1648.14
T2	2	1170.00	1565.36	1930.14	1591.36
T3	3	1173.68	1548.86	1952.56	1592.03
T4	4	1186.75	1602.52	1903.69	1613.64
T5	5	1173.38	1603.63	1892.68	1610.23

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	242.89	785.33	570.51	1598.73
T2	2	281.58	912.97	664.17	1858.72
T3	3	283.08	906.75	660.93	1850.76
T4	4	245.52	776.67	568.43	1590.62
T5	5	241.62	782.39	572.58	1596.59

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	♂	2585	1787	151	28	1.07	611	23.63	34.20	519	20.07	29.05	1130	43.71	63.25	69.10	74.96
		♀	2351	1649	132	34	1.45	570	24.22	34.53	482	20.50	29.23	1052	44.73	63.77	70.14	75.77
		♂	2468	1718	142	31	1.25	590	23.91	34.36	501	20.28	29.14	1091	63.50	44.19	69.59	75.34
T2	2	♂	2687	1857	152	26	0.99	639	23.79	34.42	554	20.64	29.86	1194	44.43	64.28	69.11	74.78
		♀	2358	1645	134	29	1.23	566	24.00	34.41	481	20.40	29.25	1047	44.40	63.66	69.74	75.44
		♂	2523	1751	143	28	1.10	603	23.89	34.42	518	20.52	29.57	1120	63.99	44.41	69.41	75.09
T3	3	♂	2609	1822	146	26	0.98	628	24.08	34.48	535	20.51	29.37	1163	44.60	63.84	69.86	75.44
		♀	2302	1609	135	25	1.08	554	24.08	34.45	466	20.22	28.93	1020	44.30	63.37	69.91	75.77
		♂	2455	1716	140	25	1.02	591	24.08	34.46	500	20.38	29.16	1092	63.62	44.46	69.88	75.59
T4	4	♂	2619	1815	148	25	0.97	613	23.42	33.79	535	20.43	29.47	1148	43.85	63.26	69.31	74.97
		♀	2345	1650	133	28	1.19	553	23.59	33.51	483	20.62	29.29	1037	44.21	62.80	70.39	76.08
		♂	2482	1733	141	27	1.07	583	23.50	33.66	509	20.52	29.38	1092	63.04	44.02	69.82	75.50
T5	5	♂	2661	1836	153	26	0.96	623	23.41	33.94	540	20.30	29.43	1163	43.71	63.37	68.98	74.72
		♀	2311	1622	138	27	1.15	545	23.57	33.60	478	20.67	29.46	1023	44.25	63.06	70.16	76.12
		♂	2486	1729	145	26	1.05	584	23.49	33.78	509	20.47	29.45	1093	63.23	43.96	69.53	75.37

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

Treatment	Tr. No.	Evaluation	
		right foot	left foot
T1	1	0.20	0.22
T2	2	0.33	0.31
T3	3	0.37	0.40
T4	4	0.43	0.49
T5	5	0.31	0.33

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	153	2531.75	213.25	8.42	260	2285.35	217.11	9.50
T2	2	200	2615.89	209.02	7.99	284	2316.91	198.13	8.55
T3	3	212	2597.39	215.49	8.30	272	2308.42	252.50	10.94
T4	4	175	2570.41	246.60	9.59	238	2304.58	275.77	11.97
T5	5	173	2602.43	196.03	7.53	241	2288.23	207.07	9.05

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	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	6	45.02	0.22		o	o	o	o
T2	2	7	45.05	0.67	1.000000		o	o	o
T3	3	7	44.88	0.81	1.000000	1.000000		o	o
T4	4	6	44.73	0.57	1.000000	0.794213	1.000000		o
T5	5	6	45.25	0.49	1.000000	1.000000	1.000000	1.000000	

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	420	527.69	61.50		o	o	o	o
T2	2	490	536.21	50.35	0.269103		o	o	o
T3	3	490	537.11	58.00	0.175808	0.999523		o	o
T4	4	420	537.31	54.23	0.189083	0.999080	0.999999		o
T5	5	420	535.53	57.33	0.395456	0.999867	0.996298	0.994841	

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	417	1670.49	173.71		***	***	o	o
T2	2	488	1730.60	181.85	0.000053		o	o	o
T3	3	487	1738.63	185.96	0.000002	0.975083		*	*
T4	4	416	1695.71	180.97	0.396203	0.077944	0.012910		o
T5	5	420	1697.17	177.42	0.333395	0.100938	0.018074	0.999977	

Body weight - day 35

Tab. No. 7d

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	413	2376.63	246.18		***	***	o	o
T2	2	484	2440.45	250.44	0.000000		o	***	***
T3	3	484	2435.00	276.87	0.000000	1.000000		***	***
T4	4	413	2417.22	294.49	0.202462	0.000001	0.000000		o
T5	5	414	2419.53	254.94	0.163072	0.000002	0.000001	1.000000	

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	34.48	1.01		o	o	o	o
T2	2	7	35.08	0.66	0.865846		o	o	o
T3	3	7	35.16	0.99	0.807762	0.999937		o	o
T4	4	6	35.18	1.06	0.807954	0.999832	0.999999		o
T5	5	6	35.02	1.13	0.916231	0.999976	0.999429	0.999040	

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	81.64	3.82		o	o	o	o
T2	2	7	85.33	3.25	0.427986		o	o	o
T3	3	7	85.83	2.90	0.302641	0.999204		o	o
T4	4	6	82.75	3.01	0.986847	0.745820	0.604391		o
T5	5	6	82.97	3.66	0.974061	0.802956	0.669537	0.999976	

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	100.92	7.91		o	o	o	o
T2	2	7	101.42	11.41	0.999993		o	o	o
T3	3	7	99.47	8.06	0.999500	0.998160		o	o
T4	4	6	103.22	12.86	0.997417	0.998838	0.980665		o
T5	5	6	103.16	11.62	0.997648	0.998970	0.981684	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	66.63	1.31		o	o	o	o
T2	2	7	68.45	2.12	0.571096		o	o	o
T3	3	7	68.29	1.55	0.653301	0.999918		o	o
T4	4	6	67.82	2.59	0.879468	0.984892	0.994998		o
T5	5	6	67.83	1.65	0.875350	0.985991	0.995494	1.000000	

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	1097.11	77.71		o	o	o	o
T2	2	7	1071.90	17.86	0.912127		o	o	o
T3	3	7	1075.82	15.29	0.950657	0.999914		o	o
T4	4	6	1088.60	31.46	0.998650	0.979384	0.992459		o
T5	5	6	1075.49	61.48	0.954261	0.999949	1.000000	0.992782	

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	1471.64	42.41		o	o	o	o
T2	2	7	1412.95	41.33	0.205078		o	o	o
T3	3	7	1402.77	37.48	0.096737	0.994656		o	o
T4	4	6	1439.68	37.39	0.779822	0.855111	0.645462		o
T5	5	6	1437.93	50.03	0.744611	0.882960	0.685746	0.999996	

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	1616.75	17.63		o	o	o	o
T2	2	7	1562.96	47.77	0.251311		o	o	o
T3	3	7	1563.04	38.97	0.252668	1.000000		o	o
T4	4	6	1584.29	39.37	0.747828	0.922179	0.923173		o
T5	5	6	1580.99	49.09	0.675116	0.956430	0.957122	0.999947	

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	1199.63	86.82		o	o	o	o
T2	2	7	1170.26	20.34	0.903639		o	o	o
T3	3	7	1174.03	19.64	0.939242	0.999956		o	o
T4	4	6	1187.56	36.49	0.996748	0.985223	0.994173		o
T5	5	6	1174.97	69.90	0.953159	0.999908	1.000000	0.996182	

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	1647.15	65.90		o	o	o	o
T2	2	7	1566.99	58.40	0.358688		o	o	o
T3	3	7	1550.55	61.60	0.189254	0.994646		o	o
T4	4	6	1604.28	61.15	0.873408	0.909104	0.727261		o
T5	5	6	1606.69	88.60	0.894796	0.888524	0.694149	0.999998	

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	1961.67	182.97		o	o	o	o
T2	2	7	1948.93	192.24	0.999974		o	o	o
T3	3	7	1963.84	164.31	1.000000	0.999943		o	o
T4	4	6	1916.07	137.34	0.996522	0.998881	0.995196		o
T5	5	6	1918.86	271.38	0.997278	0.999211	0.996192	1.000000	

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	1648.28	18.25		o	o	o	o
T2	2	7	1592.56	49.78	0.253662		o	o	o
T3	3	7	1592.64	40.54	0.255027	1.000000		o	o
T4	4	6	1614.51	40.80	0.746761	0.924502	0.925477		o
T5	5	6	1611.33	50.81	0.679346	0.956041	0.956736	0.999960	

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	1.07	0.19		o	o	o	o
T2	2	7	0.98	0.16	0.933943		o	o	o
T3	3	7	0.98	0.18	0.907021	0.999986		o	o
T4	4	6	0.97	0.15	0.888193	0.999808	0.999987		o
T5	5	6	0.96	0.18	0.869816	0.999494	0.999929	0.999999	

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	23.63	0.35		o	o	o	o
T2	2	7	23.78	1.04	0.998229		o	o	o
T3	3	7	24.08	0.75	0.894760	0.969583		o	o
T4	4	6	23.42	0.64	0.993724	0.949531	0.674982		o
T5	5	6	23.41	0.86	0.993517	0.948639	0.672750	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	34.19	0.58		o	o	o	o
T2	2	7	34.41	1.37	0.997364		o	o	o
T3	3	7	34.47	1.09	0.992669	0.999972		o	o
T4	4	6	33.78	0.81	0.972452	0.869564	0.823612		o
T5	5	6	33.94	0.95	0.995704	0.951505	0.924030	0.999256	

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	20.08	0.41		o	o	o	o
T2	2	7	20.63	0.63	0.502962		o	o	o
T3	3	7	20.51	0.71	0.717299	0.996263		o	o
T4	4	6	20.43	0.50	0.866587	0.974792	0.999089		o
T5	5	6	20.30	0.28	0.969484	0.874770	0.973444	0.996951	

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	29.05	0.60		o	o	o	o
T2	2	7	29.86	0.70	0.357114		o	o	o
T3	3	7	29.36	0.76	0.951120	0.760350		o	o
T4	4	6	29.47	0.65	0.887402	0.895043	0.999275		o
T5	5	6	29.44	0.64	0.909031	0.870787	0.999775	0.999997	

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	43.70	0.35		o	o	o	o
T2	2	7	44.41	1.03	0.607687		o	o	o
T3	3	7	44.59	0.82	0.385477	0.995334		o	o
T4	4	6	43.84	0.64	0.998779	0.775371	0.553676		o
T5	5	6	43.72	0.73	1.000000	0.623829	0.399943	0.999164	

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	63.25	0.67		o	o	o	o
T2	2	7	64.27	0.83	0.168326		o	o	o
T3	3	7	63.84	0.66	0.674583	0.851761		o	o
T4	4	6	63.25	0.54	1.000000	0.169860	0.677486		o
T5	5	6	63.38	0.71	0.998255	0.290553	0.843628	0.998358	

Ratio of abd. fat to live weight - ♀

Tab. No. 12a

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	1.45	0.15		o	o	o	o
T2	2	7	1.23	0.23	0.467529		o	o	o
T3	3	7	1.08	0.25	0.061579	0.775154		o	o
T4	4	6	1.19	0.19	0.328539	0.997647	0.931524		o
T5	5	6	1.15	0.20	0.207345	0.973915	0.986020	0.998739	

Breast muscles % total weight - ♀

Tab. No. 12b

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	6	24.22	0.68		o	o	o	o
T2	2	7	23.98	0.87	0.986710		o	o	o
T3	3	7	24.08	0.89	0.998305	0.999489		o	o
T4	4	6	23.58	0.55	0.701806	0.919483	0.835665		o
T5	5	6	23.56	0.65	0.683819	0.909092	0.820609	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	34.53	1.03		o	o	o	o
T2	2	7	34.39	1.12	0.999258		o	o	o
T3	3	7	34.45	0.77	0.999882	0.999983		o	o
T4	4	6	33.52	0.86	0.461334	0.569545	0.514226		o
T5	5	6	33.59	0.69	0.536268	0.648860	0.593497	0.999948	

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	20.52	0.69		o	o	o	o
T2	2	7	20.39	0.43	0.997438		o	o	o
T3	3	7	20.22	0.43	0.936321	0.989908		o	o
T4	4	6	20.60	0.75	0.999453	0.980634	0.851937		o
T5	5	6	20.67	0.60	0.994090	0.943776	0.753358	0.999726	

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	29.25	0.97		o	o	o	o
T2	2	7	29.25	0.45	1.000000		o	o	o
T3	3	7	28.94	0.74	0.963661	0.956851		o	o
T4	4	6	29.27	0.69	0.999998	0.999998	0.951351		o
T5	5	6	29.47	0.68	0.989841	0.988807	0.781234	0.993672	

Total muscles % total weight - ♀

Tab. No. 12f

Treatment	Treat. No.	No. of box	%	Standard deviation	Scheffe test				
					T1	T2		T3	T4
T1	1	6	44.74	0.66		o	o	o	o
T2	2	7	44.37	1.06	0.975340		o	o	o
T3	3	7	44.30	0.95	0.954502	0.999959		o	o
T4	4	6	44.18	1.14	0.905083	0.997841	0.999610		o
T5	5	6	44.24	0.88	0.933952	0.999460	0.999966	0.999985	

Total muscles % body carcass - ♀

Tab. No. 12g

Treatment	Treat. No.	No. of box	%	Standard deviation	Kruskal-Wallis test				
					T1	T2		T3	T4
T1	1	6	63.78	1.03		o	o	o	o
T2	2	7	63.64	1.18	1.000000		o	o	o
T3	3	7	63.39	0.60	1.000000	1.000000		o	o
T4	4	6	62.79	1.21	1.000000	0.488998	1.000000		o
T5	5	6	63.06	0.47	1.000000	0.525390	1.000000	1.000000	

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	44.93	70	540.34	70	1581.17	70	2367.16
		6	70	44.71	70	524.26	70	1665.24	70	2355.79
		11	70	45.00	70	510.67	69	1699.46	69	2347.36
		16	70	45.36	70	547.59	70	1693.33	69	2351.22
		21	70	45.14	70	515.54	69	1676.32	68	2372.94
		26	70	45.00	70	527.71	69	1708.48	67	2468.36
T2	2	2	70	44.36	70	532.64	70	1677.07	70	2517.23
		7	70	45.43	70	537.23	70	1692.67	70	2489.73
		12	70	45.71	70	522.13	70	1680.71	70	2309.39
		17	70	45.29	70	542.19	68	1790.96	67	2498.40
		22	70	45.43	70	537.34	70	1715.63	69	2382.23
		27	70	43.86	70	530.43	70	1769.47	68	2457.88
T3	3	3	70	43.57	70	560.69	70	1721.36	69	2508.25
		8	70	45.14	70	529.41	69	1678.70	69	2424.45
		13	70	45.36	70	536.93	70	1710.94	69	2330.52
		18	70	44.43	70	526.94	70	1737.93	69	2447.93
		23	70	45.50	70	523.34	70	1747.61	70	2432.01
		28	70	44.29	70	532.21	69	1788.30	69	2460.07
T4	4	4	70	44.50	70	545.57	69	1684.58	67	2545.91
		9	70	45.64	70	546.50	69	1690.48	69	2487.74
		14	70	44.86	70	538.21	70	1641.87	70	2308.07
		19	70	44.50	70	547.80	69	1696.06	69	2413.19
		24	70	43.93	70	507.41	70	1704.49	70	2329.64
		29	70	44.93	70	538.37	69	1757.45	68	2425.44
T5	5	5	70	45.86	70	513.44	70	1644.20	70	2435.53
		10	70	45.71	70	544.53	70	1741.61	70	2475.23
		15	70	45.43	70	557.26	70	1678.64	70	2319.03
		20	70	44.64	70	529.21	70	1633.10	68	2438.25
		25	70	44.93	70	525.34	70	1705.60	70	2461.63
		30	70	44.93	70	543.40	70	1779.84	66	2386.12

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	495.41	35.39	1040.83	74.34	785.99	112.28	2322.23	66.35
		6	479.55	34.25	1140.99	81.50	690.54	98.65	2311.08	66.03
		11	465.67	33.26	1188.79	84.91	647.90	92.56	2302.36	65.78
		16	502.23	35.87	1145.74	81.84	657.89	93.98	2305.86	65.88
		21	470.40	33.60	1160.78	82.91	696.62	99.52	2327.80	66.51
		26	482.71	34.48	1180.76	84.34	759.88	108.55	2423.36	69.24
T2	2	2	488.28	34.88	1144.43	81.74	840.16	120.02	2472.87	70.65
		7	491.80	35.13	1155.44	82.53	797.06	113.87	2444.30	69.84
		12	476.42	34.03	1158.59	82.76	628.67	89.81	2263.68	64.68
		17	496.90	35.49	1248.77	89.20	707.45	101.06	2453.11	70.09
		22	491.91	35.14	1178.29	84.16	666.60	95.23	2336.80	66.77
		27	486.57	34.75	1239.04	88.50	688.41	98.34	2414.02	68.97
T3	3	31	506.21	36.16	1237.94	88.42	641.01	91.57	2385.17	68.15
		3	517.12	36.94	1160.67	82.91	786.89	112.41	2464.68	70.42
		8	484.27	34.59	1149.28	82.09	745.75	106.54	2379.31	67.98
		13	491.57	35.11	1174.01	83.86	619.58	88.51	2285.16	65.29
		18	482.51	34.47	1210.99	86.50	710.00	101.43	2403.50	68.67
		23	477.84	34.13	1224.27	87.45	684.40	97.77	2386.51	68.19
T4	4	28	487.92	34.85	1256.09	89.72	671.77	95.97	2415.78	69.02
		32	504.35	36.03	1235.90	88.28	655.67	93.67	2395.92	68.45
		4	501.07	35.79	1139.01	81.36	861.33	123.05	2501.41	71.47
		9	500.86	35.78	1143.98	81.71	797.26	113.89	2442.10	69.77
		14	493.35	35.24	1103.66	78.83	666.20	95.17	2263.21	64.66
		19	503.30	35.95	1148.26	82.02	717.13	102.45	2368.69	67.68
T5	5	24	463.48	33.11	1197.07	85.51	625.16	89.31	2285.71	65.31
		29	493.44	35.25	1219.08	87.08	667.99	95.43	2380.51	68.01
		5	467.58	33.40	1130.76	80.77	791.33	113.05	2389.67	68.28
		10	498.82	35.63	1197.09	85.51	733.61	104.80	2429.52	69.41
		15	511.83	36.56	1121.39	80.10	640.39	91.48	2273.60	64.96
		20	484.57	34.61	1103.89	78.85	805.15	115.02	2393.61	68.39
T5	5	25	480.41	34.32	1180.26	84.30	756.03	108.00	2416.70	69.05
		30	498.47	35.61	1236.44	88.32	606.28	86.61	2341.19	66.89

Feed conversion ratio (Feed konsum. per 1 kg of live weight) per

Tab. No. 13c

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	1081.32	1537.74	1617.37
		6	1125.40	1465.51	1620.63
		11	1077.01	1430.58	1638.24
		16	984.84	1431.67	1630.51
		21	1223.95	1505.43	1603.86
		26	1090.15	1458.88	1589.90
T2	2	2	1100.98	1447.08	1516.69
		7	1068.98	1453.49	1538.32
		12	1083.20	1460.94	1659.38
		17	1050.77	1371.47	1535.10
		22	1072.21	1414.31	1587.60
		27	1076.76	1369.82	1554.65
T3	3	31	1050.38	1373.53	1548.97
		3	1054.83	1424.71	1546.78
		8	1087.46	1467.83	1595.72
		13	1059.73	1416.51	1628.66
		18	1072.49	1401.34	1533.66
		23	1098.98	1378.86	1545.46
T4	4	28	1077.17	1357.72	1516.49
		32	1080.10	1372.43	1574.52
		4	1090.60	1439.95	1544.55
		9	1079.34	1430.12	1556.82
		14	1097.01	1504.29	1649.43
		19	1043.13	1439.20	1580.99
T5	5	24	1140.23	1436.96	1610.92
		29	1081.30	1387.56	1563.04
		5	1143.54	1458.72	1565.22
		10	1092.16	1403.54	1550.22
		15	958.78	1458.15	1644.10
		20	1085.17	1506.78	1582.65
T5	5	25	1090.17	1438.29	1513.98
		30	1083.13	1362.08	1629.77

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	1179.39	1774.69	1777.57	1648.66
		6	1230.33	1621.78	1994.70	1651.98
		11	1181.09	1582.83	2189.91	1670.43
		16	1073.79	1645.22	2151.01	1662.74
		21	1341.40	1632.28	1761.55	1635.79
		26	1191.77	1626.13	1895.27	1620.07
T2	2	2	1201.00	1608.16	1655.64	1543.90
		7	1167.73	1632.27	1718.46	1566.91
		12	1187.13	1631.18	2189.88	1692.89
		17	1146.55	1514.21	1961.20	1564.17
		22	1171.23	1570.32	2041.19	1618.61
		27	1173.82	1495.28	2037.41	1583.03
		31	1144.36	1517.49	2038.73	1578.39
T3	3	3	1143.71	1603.38	1740.49	1574.53
		8	1188.82	1645.44	1885.07	1626.33
		13	1157.52	1579.68	2222.87	1661.11
		18	1171.25	1544.43	1858.19	1562.03
		23	1203.62	1498.50	1970.86	1574.92
		28	1174.95	1478.29	1941.02	1544.61
		32	1178.31	1504.15	2128.38	1604.96
T4	4	4	1187.46	1608.76	1697.79	1572.89
		9	1177.69	1599.96	1826.91	1586.24
		14	1196.76	1702.91	2007.12	1682.12
		19	1135.36	1628.38	1920.90	1610.84
		24	1248.31	1562.74	2085.19	1641.88
		29	1179.76	1522.90	1958.53	1593.11
T5	5	5	1255.70	1601.83	1786.51	1595.26
		10	1192.25	1545.18	1898.43	1579.38
		15	1043.88	1706.31	2131.53	1676.95
		20	1185.13	1708.90	1663.14	1612.58
		25	1192.13	1593.24	1684.74	1542.13
		30	1180.76	1484.67	2348.83	1661.68

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	40.90	129.30	97.80	268.00
		6	41.30	129.53	96.42	267.25
		11	38.50	131.40	97.90	267.80
		16	37.75	131.95	97.40	267.10
		21	44.17	130.71	84.72	259.60
		26	40.27	132.44	96.27	268.98
T2	2	2	41.05	128.83	97.37	267.25
		7	40.20	132.02	95.88	268.10
		12	39.59	132.29	96.37	268.25
		17	39.88	129.12	92.80	261.80
		22	40.33	129.52	93.65	263.50
		27	39.98	129.69	96.62	266.29
T3	3	31	40.55	131.50	91.48	263.53
		3	41.40	130.27	96.03	267.70
		8	40.30	130.60	97.00	267.90
		13	39.83	129.82	95.05	264.70
		18	39.56	130.92	92.17	262.65
		23	40.26	128.42	94.42	263.10
T4	4	28	40.13	128.15	89.97	258.25
		32	41.60	128.57	96.29	266.46
		4	41.65	127.15	98.20	267.00
		9	41.29	126.41	100.50	268.20
		14	41.33	131.56	93.60	266.49
		19	40.00	130.73	95.05	265.78
T5	5	24	40.50	130.95	91.25	262.70
		29	40.75	129.87	89.83	260.45
		5	41.10	126.79	98.96	266.85
		10	41.63	129.48	97.49	268.60
		15	37.40	133.94	95.55	266.89
		20	40.20	132.05	94.19	266.44
T5	5	25	40.09	131.63	89.16	260.88
		30	41.20	128.50	97.23	266.93

Foot pad lesions

Tab. No. 13f

Treatment	Tr. No.	Box	Evaluation	
			right foot	left foot
T1	1	1	0.21	0.23
		6	0.17	0.10
		11	0.00	0.03
		16	0.36	0.51
		21	0.35	0.35
		26	0.07	0.07
T2	2	2	0.37	0.20
		7	0.46	0.33
		12	0.16	0.27
		17	0.45	0.57
		22	0.49	0.38
		27	0.31	0.32
T3	3	3	0.25	0.19
		8	0.04	0.04
		13	0.58	0.67
		18	0.87	0.86
		23	0.61	0.61
		28	0.09	0.25
T4	4	4	0.22	0.12
		9	0.29	0.19
		14	0.40	0.59
		19	1.32	1.55
		24	0.31	0.31
		29	0.04	0.15
T5	5	5	0.44	0.33
		10	0.16	0.10
		15	0.73	0.70
		20	0.32	0.49
		25	0.07	0.06
		30	0.11	0.29