



MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE ÚSTRAŠICE

státní podnik

390 02 Tábor 2

Česká republika

BROILER FEEDING TEST No. 6/2023

XXXXX

XXXXX

7 June – 11 July 2023

Study Investigator:

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Aim of the project

The objective of this study was to evaluate the effects of tested products and their dose effect on oocyst shedding, lesion scores and health performance parameters on coccidial vaccine challenged chicks.

Basic tests information

The basic dates

Beginning of the test: 7 June 2023

End of the test: 11 July 2023

Location of the test

Mezinárodní testování drůbeže s.p., Ústrašice

Material and methods

Material

In total there were 800 day old male broiler chicks of xxxxx. Day old chicks were randomly distributed into 5 treatments (4 pens for sample).

Experimental treatments

Treatment	No. of birds	Starter D1-13		Grower D14-28		Finisher D29-35		Coccivaccine on D1
		Product	Inclusion rate	Product	Inclusion rate	Product	Inclusion rate	
1	xxxxxx	160	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	YES
2	xxxxxx	160	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	YES
3	xxxxxx	160	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	YES
4	xxxxxx	160	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	NO
5	xxxxxx	160	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	YES

Origin 1-day old chicks:

hatchery xxxxxx

age of the breeding flock – 43 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

Veterinary precautions

The chicken house was disinfected by xxxxx before the chick placement. On days 1 and 12 chickens were vaccinated with xxxxx. On day 1 chickens from treatment 1, 2, 3 and 5 were vaccinated with xxxxx.

Feed

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

Day 1 – 13	Starter (BR1)
Day 14 – 28	Grower (BR2)
Day 29 – 35	Finisher (BR3)

Diet formulas

Components (%)	Starter BR1	Grower BR2	Finisher BR3
Wheat	10.000	11.550	10.000
Maize	28.500	30.000	37.062
Soybean meal	36.077	34.000	28.387
Barley	15.000	15.000	15.000
Soybean oil	4.000	5.800	6.000
L-lysine HCl	0.330	0.280	0.300
DL-methionine	0.070	0.050	0.060
L-threonine	0.020	0.020	0.020
Limestone	1.393	1.250	1.101
Salt	0.260	0.300	0.300
MCP	1.200	1.100	1.120
Na ₂ CO ₃	0.150	0.150	0.150
Premix AMVBR1 Plus	3.000	-	-
Premix AMVBR2 Plus	-	0.500	-
Premix AMVBR3 Plus	-	-	0.500
Nutrient content			
Crude protein (g/kg)	207.240	201.010	180.210
ME (MJ/kg)	11.521	12.308	12.533
Lysine (g/kg)	14.310	13.420	12.110
Methionine (g/kg)	6.080	5.400	4.940
Met.+Cys. (g/kg)	9.730	8.980	8.220
Ca (g/kg)	9.600	8.746	7.902
P (g/kg)	6.449	6.194	6.025
Na (g/kg)	1.490	1.643	1.638

Feed analyses for nutrient contents were performed at the laboratory of xxxxx

Nutrient content	Starter BR1	Grower BR2	Finisher BR3
Crude protein (g/kg)	219.00	210.00	185.00
ME (MJ/kg)	12.80	13.00	13.20
Starch (g/kg)	405.00	394.00	432.00
Ca (g/kg)	12.10	11.00	6.81
P (g/kg)	6.68	6.33	6.01
Dry matter (%)	90.74	90.11	89.40
Fat (g/kg)	60.20	75.30	78.60
Crude fibre (g/kg)	30.90	34.50	26.90

Parameters recorded and methods applied

Live weight

Live weight was measured on days 1 (all the birds in each pen were weighed altogether). Chick were individual weighed on days 13, 21, 28 and 35.

Weight gain

Weight gain per phase and average daily weight gains were calculated for the periods 1 – 13 days, 14 – 21 days, 22 – 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 – 13 days, 14 – 21 days, 22 – 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 (1 – 13 days), grower (14 – 21 days and 22 – 28 days) and finisher (29 – 35 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. Mortality was recorded for the periods 1 – 13 days, 14 – 21 days, 22 – 28 days, 29 – 35 days and 1 – 35 days.

Statistical analyses

Performance results of live weight (on days 1, 14, 21, 28 and 35), daily weight gain and feed conversion ratio were statistically evaluated using the ANOVA single-factor model (Duncan test, 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 Statistical analysis of body weight at the age of 35 days

(average body weight, standard deviation, coefficient of variation)

5 - 8 Statistical analyses of performance results

9 Performance results per pen:

9a Body weight

9b Weight gain

9c Feed conversion ratio per 1 kg of live weight

9d Feed consumption per 1 kg of weight gain

9e Feed consumption

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	98.70	89.40	90.58	160	62.27	40.14
T2	2				160		40.68
T3	3				160		40.27
T4	4				160		40.27
T5	5				160		39.73

Body weight per phases

Tab. No. 2a

Treatment	Tr. No.	Day 1		Day 13		Day 21		Day 28		Day 35	
		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	160	40.14	136	433.45	109	925.03	109	1478.83	84	2207.42
T2	2	160	40.68	136	419.57	109	901.80	109	1439.28	85	2163.98
T3	3	160	40.27	136	436.73	109	947.06	109	1522.25	84	2222.87
T4	4	160	40.27	127	440.52	103	1006.39	103	1614.78	79	2322.43
T5	5	160	39.73	136	427.35	112	949.71	111	1521.65	87	2217.06

Weight gain per phases

Tab. No. 2b

Treatment	Tr. No.	Day 1 - 13		Day 14 - 21		Day 22 - 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	Weight gain per phase	Daily weight gain
		g	g	g	g	g	g	g	g	g	g
T1	1	393.31	30.25	491.58	61.45	553.81	79.12	728.58	104.08	2167.28	61.92
T2	2	378.90	29.15	482.22	60.28	537.49	76.78	724.69	103.53	2123.30	60.67
T3	3	396.46	30.50	510.34	63.79	575.18	82.17	700.62	100.09	2182.60	62.36
T4	4	400.25	30.79	565.87	70.73	608.39	86.91	707.65	101.09	2282.16	65.20
T5	5	387.62	29.82	522.36	65.29	571.94	81.71	695.41	99.34	2177.33	62.21

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

Tab. No. 2c

Treatment	Tr. No.	Feed conversion ratio			
		Day 13	Day 21	Day 28	Day 35
		g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	1142.67	1293.58	1392.01	1487.40
T2	2	1112.23	1256.66	1321.27	1431.64
T3	3	1105.40	1284.75	1327.61	1459.85
T4	4	1073.88	1195.56	1252.67	1394.92
T5	5	1102.19	1235.52	1303.79	1430.11

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

Treatment	Tr. No.	Feed consumption per 1 kg of weight gain				
		1-13 days	14-21 days	22-28 days	29-35 days	1-35 days
		g/kg WG	g/kg WG	g/kg WG	g/kg WG	g/kg WG
T1	1	1248.98	1450.59	1615.17	1766.32	1521.55
T2	2	1220.97	1403.88	1468.95	1743.94	1465.51
T3	3	1207.90	1466.89	1422.92	1856.98	1492.88
T4	4	1178.08	1307.21	1381.02	1865.74	1427.02
T5	5	1205.09	1364.70	1453.78	1810.26	1461.80

Feed consumption per phases

Tab. No. 2e

Treatment	Tr. No.	Feed consumption				
		Starter (1-13 days)	Grower (14-21 days)	Grower (22-28 days)	Finisher (29-35 days)	Total
		kg	kg	kg	kg	kg
T1	1	79.74	97.30	97.50	119.14	393.68
T2	2	75.18	93.10	86.06	118.64	372.98
T3	3	77.64	101.45	89.21	124.96	393.26
T4	4	72.36	96.00	86.54	114.70	369.60
T5	5	75.90	97.00	92.60	122.50	388.00

Mortality

Tab. No. 3

Treatment	Tr. No.	Mortality in the period											Mortality according causes														
		Day 1 – 13		Day 14 - 21		Day 22 - 28		Day 29 - 35		Day 1 - 35			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		birds	g	birds	g	birds	g	birds	g	birds	g	%															
T1	1	0	0	3	925	0	0	1	520	4	1445	2.50									3	1				72	
T2	2	0	0	3	1424	0	0	0	0	3	1424	1.88									3					72	
T3	3	0	0	3	1090	0	0	1	1238	4	2328	2.50									3	1				72	
T4	4	9	362	0	0	0	0	0	0	9	362	5.63												9		72	
T5	5	0	0	0	0	1	1160	0	0	1	1160	0.63									1					72	

- Causes:
- | | | |
|-------------------------|------------------------------------|-----------------------------------------|
| 1 – Viral diseases | 6 – Wounds | 11 – Sudden death syndrome |
| 2 – Bacterial diseases | 7 – Digestive track diseases | 12 – Cannibalism |
| 3 – Moulds diseases | 8 – Respiratory tract diseases | 13 – Yolk sac. infam. |
| 4 – Parasitary diseases | 9 – Reproduction tract diseases | 14 – Culling and other causes |
| 5 – Tumors | 10 – Locomotion apparatus diseases | 15 – Sampling (excluded of calculation) |

Statistical analysis - Body weight at 35 days of age**Tab. No. 4**

Treatment	Tr. No.	Cocks			
		Number of birds	Average body weight	Standard deviation	Coefficient of variation
			g/birds	g/birds	%
T1	1	84	2207.42	277.23	12.56
T2	2	85	2163.98	283.84	13.12
T3	3	84	2222.87	272.68	12.27
T4	4	79	2322.43	263.09	11.33
T5	5	87	2217.06	236.47	10.67

Statistical analyses of performance results

Performance results were statistically evaluated using the ANOVA single-factor model (Duncan test, 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. 5a

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	40.14	0.52		o	o	o	o
T2	2	4	40.68	0.27	0.065146		o	o	**
T3	3	4	40.27	0.31	0.618626	0.128110		o	o
T4	4	4	40.27	0.31	0.599221	0.146521	1.000000		o
T5	5	4	39.73	0.31	0.128110	0.003510	0.065146	0.058502	

Body weight - day 13

Tab. No. 5c

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	136	433.45	34.85		o	o	o	o
T2	2	136	419.57	45.23	0.161126		*	**	o
T3	3	136	436.73	45.19	0.985004	0.040434		o	o
T4	4	127	440.52	43.99	0.799553	0.006254	0.975868		o
T5	5	136	427.35	52.01	0.865778	0.723829	0.556651	0.221539	

Body weight - day 21

Tab. No. 5d

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	109	925.03	121.29		o	o	***	o
T2	2	109	901.80	116.69	0.701386		o	***	o
T3	3	109	947.06	108.76	0.741514	0.082562		**	o
T4	4	103	1006.39	99.33	0.000040	0.000000	0.008270		*
T5	5	112	949.71	130.00	0.644426	0.052575	0.999898	0.012860	

Body weight - day 28

Tab. No. 5e

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	109	1478.83	194.22		o	o	***	o
T2	2	109	1439.28	184.01	0.615294		*	***	*
T3	3	109	1522.25	177.05	0.523365	0.020324		**	o
T4	4	103	1614.78	167.92	0.000005	0.000000	0.007213		**
T5	5	111	1521.65	168.98	0.532998	0.020873	1.000000	0.006315	

Body weight - day 35

Tab. No. 5f

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	84	2207.42	277.23		o	o	o	o
T2	2	85	2163.98	283.84	0.891235		o	**	o
T3	3	84	2222.87	272.68	0.997631	0.725736		o	o
T4	4	79	2322.43	263.09	0.111654	0.006673	0.228222		o
T5	5	87	2217.06	236.47	0.999618	0.790862	0.999949	0.170430	

Statistical analyses of performance results

Performance results were statistically evaluated using the ANOVA single-factor model (Duncan test, 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

Average weight gain (day 1-13)

Tab. No. 6a

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	30.25	0.45		o	o	o	o
T2	2	4	29.15	1.17	0.109018		o	*	o
T3	3	4	30.50	0.65	0.701644	0.061438		o	o
T4	4	4	30.80	0.78	0.420596	0.028062	0.635948		o
T5	5	4	29.82	1.11	0.489994	0.295921	0.314060	0.164820	

Average weight gain (day 14-21)

Tab. No. 6b

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	61.40	5.02		o	o	**	o
T2	2	4	60.21	4.40	0.665701		o	**	o
T3	3	4	63.81	3.83	0.385321	0.224315		*	o
T4	4	4	70.75	1.90	0.005401	0.002605	0.026300		o
T5	5	4	65.29	3.09	0.189692	0.101352	0.589126	0.060975	

Average weight gain (day 22-28)

Tab. No. 6c

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	79.09	5.00		o	o	*	o
T2	2	4	76.73	4.97	0.371149		o	**	o
T3	3	4	82.16	2.30	0.274914	0.068770		o	o
T4	4	4	86.98	2.93	0.011791	0.002234	0.080154		o
T5	5	4	81.67	1.51	0.330911	0.086440	0.852269	0.067642	

Average weight gain (day 29-35)

Tab. No. 6d

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	104.44	16.99		o	o	o	o
T2	2	4	103.38	7.36	1.000000		o	o	o
T3	3	4	99.78	14.47	1.000000	1.000000		o	o
T4	4	4	101.04	11.66	1.000000	1.000000	1.000000		o
T5	5	4	99.43	6.74	1.000000	1.000000	1.000000	1.000000	

Average weight gain (day 1-35)

Tab. No. 6e

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	61.98	4.62		o	o	o	o
T2	2	4	60.61	3.28	0.548802		o	o	o
T3	3	4	62.30	2.76	0.893537	0.495905		o	o
T4	4	4	65.21	3.02	0.200778	0.080366	0.211331		o
T5	5	4	62.22	0.93	0.915037	0.504466	0.972058	0.222221	

FCR 13**Tab. No. 7a**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1144.05	108.02		o	o	o	o
T2	2	4	1113.35	54.94	0.515406		o	o	o
T3	3	4	1105.54	38.77	0.440812	0.867831		o	o
T4	4	4	1073.69	55.93	0.186418	0.440370	0.522711		o
T5	5	4	1102.92	43.66	0.423906	0.833616	0.955587	0.535462	

FCR 21**Tab. No. 7b**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1295.05	66.57		o	o	o	o
T2	2	4	1259.12	63.31	0.521442		o	o	o
T3	3	4	1285.22	92.70	0.852200	0.621929		o	o
T4	4	4	1195.77	76.27	0.102419	0.264252	0.131595		o
T5	5	4	1236.11	63.23	0.311104	0.663383	0.383254	0.448575	

FCR 28**Tab. No. 7c**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1393.21	87.26		o	o	*	o
T2	2	4	1323.44	51.63	0.189648		o	o	o
T3	3	4	1327.69	69.70	0.194464	0.930984		o	o
T4	4	4	1252.64	69.08	0.017672	0.183499	0.171353		o
T5	5	4	1303.96	57.80	0.107676	0.692115	0.648115	0.304118	

FCR 35**Tab. No. 7d**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1488.79	58.86		o	o	*	o
T2	2	4	1433.55	43.58	0.144079		o	o	o
T3	3	4	1459.62	28.88	0.405368	0.456204		o	o
T4	4	4	1395.55	41.72	0.024566	0.306712	0.102434		o
T5	5	4	1430.11	60.50	0.132323	0.920872	0.424639	0.326419	

FCR weight gain - day 1-13**Tab. No. 8a**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1250.75	121.22		o	o	o	o
T2	2	4	1222.42	63.71	0.593510		o	o	o
T3	3	4	1208.10	43.57	0.448683	0.786642		o	o
T4	4	4	1177.92	61.35	0.222922	0.442273	0.590234		o
T5	5	4	1206.08	50.47	0.440582	0.770108	0.969553	0.595677	

FCR weight gain - day 14-21**Tab. No. 8b**

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1456.47	108.18		o	o	o	o
T2	2	4	1408.70	81.95	0.548567		o	o	o
T3	3	4	1468.31	156.83	0.881135	0.479217		o	o
T4	4	4	1308.31	102.16	0.098561	0.239633	0.081354		o
T5	5	4	1364.59	84.03	0.280263	0.579187	0.237833	0.480705	

FCR weight gain - day 22-28

Tab. No. 8c

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	1614.64	141.96		o	o	o	o
T2	2	4	1472.06	64.96	1.000000		o	o	o
T3	3	4	1422.93	62.54	0.729980	1.000000		o	o
T4	4	4	1380.92	58.92	0.120738	1.000000	1.000000		o
T5	5	4	1453.87	77.99	1.000000	1.000000	1.000000	1.000000	

FCR weight gain - day 29-35

Tab. No. 8d

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1785.91	208.92		o	o	o	o
T2	2	4	1750.27	135.86	0.797508		o	o	o
T3	3	4	1875.28	174.82	0.544256	0.411755		o	o
T4	4	4	1898.70	275.56	0.458108	0.339562	0.866095		o
T5	5	4	1813.93	131.76	0.840073	0.664960	0.659344	0.564997	

FCR weight gain - day 1-35

Tab. No. 8e

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1523.08	61.30		o	o	*	o
T2	2	4	1467.61	46.54	0.156731		o	o	o
T3	3	4	1492.70	29.34	0.403788	0.489015		o	o
T4	4	4	1427.72	43.26	0.026446	0.301504	0.109933		o
T5	5	4	1461.80	61.96	0.130078	0.871589	0.420547	0.350522	

Body weight (BW) per pen

Tab. No. 9a

Treatment	Tr. No.	Box No.	Day 1		Day 13		Day 21		Day 28		Day 35	
			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	40	40.54	34	426.29	27	930.07	27	1491.67	20	2329.60
		6	40	40.00	34	439.88	27	933.74	27	1514.22	21	2344.38
		12	40	40.54	34	433.26	28	964.61	28	1534.75	22	2164.32
		16	40	39.46	34	434.35	27	870.22	27	1372.63	21	1999.24
T2	2	2	40	40.54	34	399.06	27	838.19	27	1348.33	21	2068.14
		7	40	40.54	34	430.97	28	956.32	28	1537.29	22	2328.64
		11	40	40.54	34	431.15	27	910.70	27	1418.85	21	2136.33
		17	40	41.08	34	417.12	27	899.96	27	1449.04	21	2114.95
T3	3	3	40	40.54	34	439.47	28	915.39	28	1471.93	22	2282.41
		8	40	40.00	34	439.21	28	976.68	28	1570.71	21	2317.71
		15	40	40.54	34	424.74	26	959.73	26	1528.65	20	2108.25
		19	40	40.00	34	443.50	27	937.00	27	1518.00	21	2174.81
T4	4	4	40	40.54	31	455.84	25	1039.84	25	1668.92	19	2455.79
		10	40	40.54	33	438.27	27	995.63	27	1590.85	21	2359.05
		13	40	40.00	31	435.55	25	985.60	25	1609.12	19	2252.47
		18	40	40.00	32	432.81	26	1005.38	26	1593.00	20	2223.75
T5	5	5	40	40.00	34	414.44	28	946.04	28	1506.64	22	2174.00
		9	40	40.00	34	420.35	28	946.46	28	1511.25	22	2220.68
		14	40	39.46	34	446.97	28	991.57	28	1571.54	22	2222.55
		20	40	39.46	34	427.62	28	914.75	27	1496.26	21	2252.62

Weight gain per phases per pen

Tab. No. 9b

Treatment	Tr. No.	Box No.	Day 1 - 13		Day 14 - 21		Day 22 - 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	Weight gain per phase	Daily weight gain
			g	g	g	g	g	g	g	g	g	g
T1	1	1	385.75	29.67	503.78	62.97	561.59	80.23	837.93	119.70	2289.06	65.40
		6	399.88	30.76	493.86	61.73	580.48	82.93	830.16	118.59	2304.38	65.84
		12	392.72	30.21	531.34	66.42	570.14	81.45	629.57	89.94	2123.78	60.68
		16	394.89	30.38	435.87	54.48	502.41	71.77	626.61	89.52	1959.78	55.99
T2	2	2	358.52	27.58	439.13	54.89	510.15	72.88	719.81	102.83	2027.60	57.93
		7	390.43	30.03	525.35	65.67	580.96	82.99	791.35	113.05	2288.10	65.37
		11	390.61	30.05	479.56	59.94	508.15	72.59	717.48	102.50	2095.79	59.88
		17	376.04	28.93	482.85	60.36	549.07	78.44	665.92	95.13	2073.87	59.25
T3	3	3	398.93	30.69	475.92	59.49	556.54	79.51	810.48	115.78	2241.87	64.05
		8	399.21	30.71	537.47	67.18	594.04	84.86	747.00	106.71	2277.71	65.08
		15	384.19	29.55	535.00	66.87	568.92	81.27	579.60	82.80	2067.71	59.08
		19	403.50	31.04	493.50	61.69	581.00	83.00	656.81	93.83	2134.81	60.99
T4	4	4	415.30	31.95	584.00	73.00	629.08	89.87	786.87	112.41	2415.25	69.01
		10	397.73	30.59	557.36	69.67	595.22	85.03	768.20	109.74	2318.51	66.24
		13	395.55	30.43	550.05	68.76	623.52	89.07	643.35	91.91	2212.47	63.21
		18	392.81	30.22	572.57	71.57	587.62	83.95	630.75	90.11	2183.75	62.39
T5	5	5	374.44	28.80	531.59	66.45	560.61	80.09	667.36	95.34	2134.00	60.97
		9	380.35	29.26	526.11	65.76	564.79	80.68	709.43	101.35	2180.68	62.31
		14	407.51	31.35	544.60	68.08	579.96	82.85	651.01	93.00	2183.09	62.37
		20	388.16	29.86	487.13	60.89	581.51	83.07	756.36	108.05	2213.16	63.23

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

Tab. No. 9c

Treatment	Tr. No.	Box No.	Feed conversion ratio			
			Day 13	Day 21	Day 28	Day 35
			g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	1	1299.21	1362.76	1483.10	1561.08
		6	1136.19	1305.53	1432.77	1449.29
		12	1073.73	1203.32	1279.40	1433.20
		16	1067.08	1308.61	1377.57	1511.57
T2	2	2	1186.67	1346.54	1385.52	1451.60
		7	1054.58	1195.17	1264.71	1368.51
		11	1098.28	1250.41	1340.33	1461.36
		17	1113.85	1244.37	1303.20	1452.75
T3	3	3	1159.77	1419.06	1429.80	1499.92
		8	1067.77	1249.48	1314.63	1431.73
		15	1099.22	1206.37	1280.69	1449.97
		19	1095.40	1265.98	1285.66	1456.84
T4	4	4	1157.54	1304.05	1353.72	1440.96
		10	1043.91	1179.34	1235.86	1340.73
		13	1044.91	1174.74	1222.04	1392.81
		18	1048.40	1124.96	1198.94	1407.68
T5	5	5	1148.57	1322.76	1388.99	1510.12
		9	1068.51	1182.56	1260.46	1394.61
		14	1062.75	1196.43	1287.58	1441.98
		20	1131.86	1242.67	1278.83	1373.73

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

Tab. No. 9d

Treatment	Tr. No.	Box No.	Feed consumption per 1 kg of weight gain				
			1-13 days	14-21 days	22-28 days	29-35 days	1-35 days
			g/kg WG	g/kg WG	g/kg WG	g/kg WG	g/kg WG
T1	1	1	1425.61	1426.95	1750.31	1783.09	1597.39
		6	1239.13	1484.27	1714.41	1491.42	1480.54
		12	1173.98	1327.97	1450.14	1937.57	1465.73
		16	1164.29	1586.67	1543.68	1931.55	1548.64
T2	2	2	1307.23	1520.73	1473.79	1632.31	1487.95
		7	1154.97	1328.36	1416.36	1647.05	1398.04
		11	1201.84	1410.75	1562.68	1804.55	1496.18
		17	1225.65	1374.96	1435.41	1917.17	1488.29
T3	3	3	1268.71	1686.65	1453.51	1677.30	1532.89
		8	1165.42	1426.21	1454.94	1781.34	1462.65
		15	1203.67	1313.81	1454.16	2044.13	1485.12
		19	1194.61	1446.56	1329.13	1998.37	1490.13
T4	4	4	1269.80	1441.62	1464.36	1701.13	1473.57
		10	1142.53	1305.23	1362.70	1645.06	1370.04
		13	1148.81	1293.44	1326.02	2017.92	1426.06
		18	1150.53	1192.95	1370.60	2230.69	1441.22
T5	5	5	1260.27	1484.49	1535.33	1868.47	1544.02
		9	1170.19	1292.18	1431.64	1791.18	1425.79
		14	1156.61	1326.07	1492.70	1953.09	1473.28
		20	1237.24	1355.61	1355.83	1642.98	1404.10

Feed consumption per pen

Tab. No. 9e

Treatment	Tr. No.	Box No.	Feed consumption				
			Starter (1-13 days)	Grower (14-21 days)	Grower (21-28 days)	Finisher (29-35 days)	Total
			kg	kg	kg	kg	kg
T1	1	1	21.98	23.90	26.54	30.58	103.00
		6	20.24	25.05	26.87	29.46	101.62
		12	18.86	24.25	23.15	30.60	96.86
		16	18.66	24.10	20.94	28.50	92.20
T2	2	2	19.30	22.70	20.30	26.84	89.14
		7	18.20	24.20	23.04	31.76	97.20
		11	19.12	23.30	21.44	30.32	94.18
		17	18.56	22.90	21.28	29.72	92.46
T3	3	3	20.26	28.55	22.65	33.14	104.60
		8	18.86	25.90	24.20	31.30	100.26
		15	19.00	22.65	21.51	28.72	91.88
		19	19.52	24.35	20.85	31.80	96.52
T4	4	4	19.64	26.05	23.03	28.96	97.68
		10	18.14	24.40	21.90	29.56	94.00
		13	17.10	23.15	20.67	27.48	88.40
		18	17.48	22.40	20.94	28.70	89.52
T5	5	5	19.18	26.70	24.10	31.82	101.80
		9	18.20	22.90	22.64	30.64	94.38
		14	19.12	24.60	24.24	31.14	99.10
		20	19.40	22.80	21.62	28.90	92.72