



**MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE  
ÚSTRAŠICE** státní podnik

390 02 Tábor 2

Česká republika

**BROILER FEEDING TEST No. 5/2022**

**Coccidial challenge  
in broiler chicks**

**XXXXX**

**XXXXX**

**15 March – 19 April 2022**

**Study Investigator:  
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**April 2022**

## Aim of the project

The objective of the present study was to evaluate the effects of phytogetic additives (xxxxx) and their dose effect on oocyst shedding, lesion scores and performance parameters of *Eimeria acervulina*, *Eimeria tenella* and *Eimeria maxima* challenged broiler chicks.

## Basic tests information

### The basic dates

Beginning of the test: 15 March 2022

End of the test: 19 April 2022

### Location of the test

Mezinárodní testování drůbeže s.p., Ústrašice

## Material and methods

### Material

In total there were 900 day old chicks of xxxxx. Day old chicks were randomly distributed into 5 treatments (4 pens for sample).

### Experimental treatments

Treat. No.	Treatment	Description	Coccidiosis challenge	No. of pen	Birds per pen	Inclusion rate l/m <sup>3</sup> of drinking water		
						Starter phase	Grower phase	Finisher phase
1	T1	xxxxx	YES	4	45	0	0	0
2	T2	xxxxx	YES	4	45	0.8	0.8	0.8
3	T3	xxxxx	YES	4	45	2.0	2.0	2.0
4	T4	xxxxx	YES	4	45	0.8	0.8	0.8
5	T5	xxxxx	YES	4	45	2.0	2.0	2.0

Origin 1-day old chicks:

parent flock – Mezinárodní testování drůbeže, s.p.

age of the breeding flock - 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 – 31	18 hours of light + 6 hours of darkness
Day 32 – 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 chickens were vaccinated with xxxxx.

### **Feed**

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

Day 1 – 14	Starter (BR1)
Day 15 – 28	Grower (BR2)
Day 29 – 35	Finisher (BR3)

## Diet formulas

<b>Components (%)</b>	<b>Starter BR1</b>	<b>Grower BR2</b>	<b>Finisher BR3</b>
Wheat	27.00	28.50	31.25
Maize	27.00	28.50	31.25
Soybean meal	37.08	33.99	28.55
Soybean oil	4.50	4.80	5.10
L-lysine HCl	0.35	0.30	0.39
DL-methionine	0.08	0.09	0.10
L-threonine	0.20	0.20	0.20
Limestone	1.26	1.14	1.12
Salt	0.30	0.30	0.30
MCP	1.63	1.56	1.10
Sodium bicarbonate	0.10	0.12	0.14
xxxxx	0.50	-	-
xxxxx	-	0.50	-
xxxxx	-	-	0.50
<b>Nutrient content</b>			
Crude protein (g/kg)	225.65	214.45	194.87
ME (MJ/kg)	12.31	12.48	12.72
Lysine (g/kg)	14.70	13.52	12.84
Methionine (g/kg)	6.25	5.81	5.36
Met.+Cys. (g/kg)	10.05	9.46	8.75
Ca (g/kg)	9.60	8.90	7.89
P (g/kg)	7.81	7.54	6.31
Na (g/kg)	1.511	1.56	1.62
Dry matter (g/kg)	898.00	897.40	896.20
Fat (g/kg)	60.81	64.26	68.10
Crude fibre (g/kg)	30.75	30.28	29.51

## **Parameters recorded and methods applied**

### **Live weight**

Live weight was measured on days 1 (all the birds in each pen were weighed altogether). On day 3 each chicken was marked with a wing mark. Chick were individual weighed on days 3, 14, 21, 28 and 35.

### **Weight gain**

Weight gain per phase and average daily weight gains were calculated for the periods 3 – 14 days, 15 – 21 days, 22 – 28 days, 29 – 35 days and for the overall experiment (3 – 35 days).

### **Feed conversion ratio**

Feed consumption and feed conversion ratio to gain ratio were calculated for the periods 1 – 14 days, 15 – 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 – 14 days), grower (15 – 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 – 14 days, 15 – 21 days, 22 – 28 days, 29 – 35 days and 1 – 35 days.

### **Statistical analyses**

Performance results of live weight (on days 1, 3, 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	93.46	86.83	92.90	180	67.70	43.78
T2	2				180		43.78
T3	3				180		43.78
T4	4				180		43.89
T5	5				180		44.00

**Body weight per phases**

**Tab. No. 2a**

Treatment	Tr. No.	Day 1		Day 3		Day 14		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	Birds	Average body weight
			g		g		g		g		g		g
T1	1	180	43.78	179	90.30	128	417.27	102	926.18	78	1613.90	78	2371.59
T2	2	180	43.78	179	91.76	128	416.02	100	915.34	76	1569.49	74	2323.42
T3	3	180	43.78	180	89.18	129	417.81	104	934.50	80	1579.49	80	2369.85
T4	4	180	43.89	179	90.96	128	429.01	103	936.28	79	1612.48	78	2393.41
T5	5	180	44.00	180	89.18	127	404.50	103	911.48	78	1617.35	78	2427.03



**Weight gain per phases****Tab. No. 2b**

<b>Treatment</b>	<b>Tr. No.</b>	<b>Day 3 - 14</b>	<b>Day 15 - 21</b>	<b>Day 22 - 28</b>	<b>Day 29 - 35</b>	<b>Day 3 - 35</b>
		Weight gain per phase	Weight gain per phase	Weight gain per phase	Weight gain per phase	Weight gain per phase
		g	g	g	g	g
T1	1	327.34	517.96	684.71	757.69	2281.36
T2	2	324.24	506.72	656.42	754.41	2232.42
T3	3	329.04	522.94	646.23	790.36	2281.81
T4	4	337.77	517.85	679.11	786.51	2302.96
T5	5	315.62	515.11	690.19	809.68	2338.41

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

Tab. No. 2c

Treatment	Tr. No.	Feed conversion ratio			
		Day 14	Day 21	Day 28	Day 35
		g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	1191.73	1219.07	1281.87	1375.52
T2	2	1192.63	1242.23	1328.46	1436.32
T3	3	1218.88	1259.92	1312.48	1388.66
T4	4	1202.33	1241.83	1294.44	1384.55
T5	5	1196.55	1229.53	1284.22	1367.69

**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	15-21 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	1356.33	1250.40	1750.57	1656.85	1422.90
T2	2	1356.43	1301.14	1895.63	1768.90	1487.68
T3	3	1385.52	1306.31	1869.40	1602.75	1435.61
T4	4	1365.15	1287.75	1795.44	1649.27	1431.61
T5	5	1368.66	1266.28	1798.57	1599.87	1414.60

**Feed consumption per phases**

**Tab. No. 2e**

Treatment	Tr. No.	Feed consumption				
		Starter (1-14 days)	Grower (15-21 days)	Grower (22-28 days)	Finisher (29-35 days)	Total
		kg	kg	kg	kg	kg
T1	1	77.38	70.88	79.34	97.92	325.52
T2	2	77.82	71.50	79.66	98.88	327.86
T3	3	79.86	75.72	77.64	101.34	334.56
T4	4	79.64	73.38	79.04	100.64	332.70
T5	5	75.36	71.56	78.68	101.04	326.64

**Mortality**

**Tab. No. 3**

Treatment	Tr. No.	Mortality in the period											Mortality according causes														
		Day 1 - 14		Day 15 - 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	4	233	2	1296	0	0	0	0	6	1529	3.33									2			2	2	96	
T2	2	4	935	4	2311	0	0	2	3247	10	6493	5.56									6	3		1		96	
T3	3	3	595	1	300	0	0	0	0	4	895	2.22									1	2		1		96	
T4	4	4	410	1	322	0	0	1	1721	6	2453	3.33									4	1		1		96	
T5	5	5	735	0	0	1	280	0	0	6	1015	3.33									1	5				96	

- 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**

<b>Treatment</b>	<b>Tr. No.</b>	<b>Cocks</b>			
		<b>Number of birds</b>	<b>Average body weight</b>	<b>Standard deviation</b>	<b>Coefficient of variation</b>
			<b>g/birds</b>	<b>g/birds</b>	<b>%</b>
T1	1	78	2371.59	234.12	9.87
T2	2	74	2323.42	203.10	8.74
T3	3	80	2369.85	254.12	10.72
T4	4	78	2393.41	226.28	9.45
T5	5	78	2427.03	238.36	9.82

### 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	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	43.78	0.26		o	o	o	o
T2	2	4	43.78	0.26	1.000000		o	o	o
T3	3	4	43.78	0.26	1.000000	1.000000		o	o
T4	4	4	43.89	0.22	1.000000	1.000000	1.000000		o
T5	5	4	44.00	0.00	1.000000	1.000000	1.000000	1.000000	

#### Body weight - day 3

Tab. No. 5b

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	179	90.30	7.18		o	o	o	o
T2	2	179	91.76	7.55	0.494645		*	o	*
T3	3	180	89.18	7.77	0.731741	0.031188		o	o
T4	4	179	90.96	6.41	0.953474	0.904662	0.282324		o
T5	5	180	89.18	8.38	0.731741	0.031188	1.000000	0.282324	

**Body weight - day 14****Tab. No. 5c**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	128	417.27	59.30		o	o	o	o
T2	2	128	416.02	59.58	0.999905		o	o	o
T3	3	129	417.81	62.55	0.999997	0.999600		o	o
T4	4	128	429.01	59.89	0.655398	0.560115	0.693638		*
T5	5	127	404.50	59.02	0.578576	0.673045	0.535095	0.032370	

**Body weight - day 21****Tab. No. 5d**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	102	926.18	102.25		o	o	o	o
T2	2	100	915.34	89.97	0.969100		o	o	o
T3	3	104	934.50	107.78	0.987988	0.788107		o	o
T4	4	103	936.28	90.91	0.975423	0.728834	0.999972		o
T5	5	103	911.48	126.79	0.907476	0.999410	0.642674	0.574790	

**Body weight - day 28****Tab. No. 5e**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	78	1613.90	153.16		o	o	o	o
T2	2	76	1569.49	131.91	0.502784		o	o	o
T3	3	80	1579.49	164.99	0.724727	0.996502		o	o
T4	4	79	1612.48	145.37	0.999998	0.533075	0.752955		o
T5	5	78	1617.35	155.07	0.999948	0.423190	0.646032	0.999792	



**Body weight - day 35**

**Tab. No. 5f**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	78	2371.59	234.12		o	o	o	o
T2	2	74	2323.42	203.10	0.802489		o	o	o
T3	3	80	2369.85	254.12	0.999999	0.819900		o	o
T4	4	78	2393.41	226.28	0.986717	0.486505	0.981864		o
T5	5	78	2427.03	238.36	0.694969	0.111454	0.663849	0.935938	

### 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 3-14)**

**Tab. No. 6a**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	128	327.34	57.90		o	o	o	o
T2	2	128	324.24	58.12	0.996123		o	o	o
T3	3	129	329.04	60.27	0.999626	0.979259		o	o
T4	4	128	337.77	57.71	0.724783	0.484137	0.835752		o
T5	5	127	315.62	56.59	0.629153	0.843816	0.492536	0.056380	

**Average weight gain (day 15-21)**

**Tab. No. 6b**

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	102	517.96	52.54		o	o	o	o
T2	2	100	506.72	56.40	0.812571		o	o	o
T3	3	104	522.94	62.15	0.988715	0.506647		o	o
T4	4	103	517.85	53.39	1.000000	0.816551	0.987661		o
T5	5	103	515.11	86.73	0.998707	0.926873	0.940201	0.998876	

Average weight gain (day 22-28)

Tab. No. 6c

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	78	684.71	67.46		o	*	o	o
T2	2	76	656.42	75.77	0.224938		o	o	o
T3	3	80	646.23	74.12	0.030112	0.944869		o	**
T4	4	79	679.11	75.58	0.993994	0.450425	0.095394		o
T5	5	78	690.19	74.28	0.994481	0.089311	0.007572	0.925578	

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	78	757.69	138.49		o	o	o	o
T2	2	74	754.41	114.22	1.000000		o	o	**
T3	3	80	790.36	126.23	0.994038	0.117914		o	o
T4	4	78	786.51	131.02	1.000000	0.192384	1.000000		o
T5	5	78	809.68	109.68	0.069718	0.003438	1.000000	1.000000	

Average weight gain (day 3-35)

Tab. No. 6e

Treatment	Treat. No.	Birds	Average (g)	Standard deviation	Scheffe test				
					T1	T2	T3	T4	T5
T1	1	78	2281.36	234.68		o	o	o	o
T2	2	74	2232.42	201.38	0.788919		o	o	o
T3	3	80	2281.81	251.97	1.000000	0.779231		o	o
T4	4	78	2302.96	225.23	0.986888	0.471205	0.987607		o
T5	5	78	2338.41	235.14	0.665455	0.093240	0.666909	0.921341	

FCR 14

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	1191.56	16.80		o	o	o	o
T2	2	4	1192.67	51.31	0.966715		o	o	o
T3	3	4	1219.01	9.15	0.354579	0.366218		o	o
T4	4	4	1202.16	7.98	0.713330	0.735018	0.527627		o
T5	5	4	1199.40	61.00	0.779675	0.799551	0.486838	0.917172	

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	1218.95	22.62		o	*	o	o
T2	2	4	1242.82	38.93	0.222529		o	o	o
T3	3	4	1259.97	11.91	0.047527	0.337449		o	o
T4	4	4	1241.84	14.47	0.228427	0.955658	0.336304		o
T5	5	4	1230.43	24.79	0.517367	0.507799	0.135528	0.519477	

FCR 28

Tab. No. 7c

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	1281.90	19.87		o	o	o	o
T2	2	4	1330.28	49.92	0.639391		o	o	o
T3	3	4	1312.80	15.83	0.558293	1.000000		o	o
T4	4	4	1294.61	21.73	1.000000	1.000000	1.000000		o
T5	5	4	1285.00	24.95	1.000000	1.000000	0.942643	1.000000	

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	1376.12	32.69		*	o	o	o
T2	2	4	1438.57	55.30	0.024837		o	*	*
T3	3	4	1389.72	21.51	0.588545	0.053474		o	o
T4	4	4	1384.66	20.11	0.719105	0.043214	0.831002		o
T5	5	4	1367.92	20.80	0.729877	0.014161	0.402218	0.506571	

FCR weight gain - day 1-14

Tab. No. 8a

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	1356.15	17.15		o	o	o	o
T2	2	4	1356.61	59.64	1.000000		o	o	o
T3	3	4	1385.95	15.38	0.942643	1.000000		o	o
T4	4	4	1365.05	4.54	1.000000	1.000000	1.000000		o
T5	5	4	1373.13	83.16	1.000000	1.000000	1.000000	1.000000	

FCR weight gain - day 15-21

Tab. No. 8b

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Kruskal-Wallis test				
					T1	T2	T3	T4	T5
T1	1	4	1250.69	44.40		o	o	o	o
T2	2	4	1306.90	100.66	1.000000		o	o	o
T3	3	4	1306.48	31.50	1.000000	1.000000		o	o
T4	4	4	1287.96	27.49	1.000000	1.000000	1.000000		o
T5	5	4	1265.51	24.19	1.000000	1.000000	1.000000	1.000000	

FCR weight gain - day 22-28

Tab. No. 8c

Treatment	Treat. No.	No. of box	Average (g/kg live weight)	Standard deviation	Duncan test				
					T1	T2	T3	T4	T5
T1	1	4	1754.07	154.48		o	o	o	o
T2	2	4	1903.79	134.84	0.189116		o	o	o
T3	3	4	1868.10	112.53	0.303731	0.722775		o	o
T4	4	4	1798.02	130.74	0.679375	0.325659	0.488641		o
T5	5	4	1796.22	159.91	0.675477	0.331091	0.500834	0.985751	

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	1672.66	146.44		o	o	o	o
T2	2	4	1776.68	122.25	0.171538		o	o	*
T3	3	4	1611.13	89.94	0.433424	0.051123		o	o
T4	4	4	1654.01	73.97	0.800339	0.128091	0.562736		o
T5	5	4	1598.09	49.84	0.357797	0.040167	0.859592	0.475823	

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	1423.56	34.93		*	o	o	o
T2	2	4	1490.25	60.14	0.027560		o	*	*
T3	3	4	1436.94	25.70	0.625402	0.053299		o	o
T4	4	4	1431.75	21.22	0.751839	0.044113	0.840908		o
T5	5	4	1415.01	22.48	0.741210	0.016186	0.439035	0.542162	

Body weight (BW) per box

Tab. No. 9a

Treatment	Tr. No.	Box No.	Day 1		Day 3		Day 14		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	Birds	Average body weight
				g		g		g		g				
T1	1	1	45	43.56	45	86.29	31	421.71	25	907.24	19	1591.95	19	2476.84
		6	45	44.00	44	88.95	32	422.97	26	927.81	20	1631.25	20	2417.25
		12	45	43.56	45	93.82	33	413.94	26	930.15	20	1619.05	20	2210.45
		16	45	44.00	45	92.11	32	410.72	25	939.28	19	1612.16	19	2387.89
T2	2	2	45	43.56	45	91.00	31	425.29	24	906.46	18	1554.00	18	2267.61
		7	45	44.00	44	90.43	32	426.50	23	937.39	17	1580.35	16	2388.88
		11	45	43.56	45	91.07	32	422.38	26	909.23	20	1586.90	19	2307.47
		17	45	44.00	45	94.51	33	391.00	27	910.33	21	1557.38	21	2335.81
T3	3	3	45	43.56	45	88.33	33	437.79	27	957.26	21	1592.48	21	2471.14
		8	45	44.00	45	92.09	32	429.38	25	933.40	19	1578.84	19	2346.84
		14	45	44.00	45	92.27	31	394.26	25	910.84	19	1540.53	19	2245.05
		19	45	43.56	45	84.02	33	408.76	27	934.67	21	1602.33	21	2402.29
T4	4	4	45	44.00	45	90.56	32	432.13	26	920.46	20	1588.15	20	2402.85
		10	45	44.00	45	91.24	32	449.41	26	938.08	20	1576.10	20	2342.90
		13	45	44.00	45	92.96	33	411.97	26	929.88	20	1622.70	19	2318.26
		18	45	43.56	44	89.02	31	422.87	25	957.52	19	1665.63	19	2511.79
T5	5	5	45	44.00	45	88.40	33	405.39	27	893.85	21	1608.00	21	2420.43
		9	45	44.00	45	87.42	33	426.39	27	937.22	21	1596.43	21	2416.48
		15	45	44.00	45	91.42	31	401.39	25	936.68	18	1683.94	18	2520.39
		20	45	44.00	45	89.47	30	382.67	24	876.08	18	1586.06	18	2353.67

Weight gain per phases per box

Tab. No. 9b

Treatment	Tr. No.	Box No.	Day 3 - 14	Day 15 - 21	Day 22 - 28	Day 29 - 35	Day 3 - 35
			Weight gain per phase	Weight gain per phase	Weight gain per phase	Weight gain per phase	Weight gain per phase
			g	g	g	g	g
T1	1	1	336.26	499.44	683.21	884.89	2391.84
		6	334.13	514.46	696.15	786.00	2329.40
		12	320.42	520.58	685.45	591.40	2115.75
		16	319.03	537.40	673.37	775.74	2294.63
T2	2	2	335.10	484.83	628.22	713.61	2177.17
		7	336.41	512.30	658.94	812.56	2300.88
		11	329.47	502.08	681.85	717.53	2215.74
		17	297.18	525.89	654.33	778.43	2242.71
T3	3	3	349.70	528.63	622.38	878.67	2384.90
		8	337.25	506.44	649.53	768.00	2255.11
		14	302.94	530.00	641.89	704.53	2153.42
		19	324.94	526.00	671.00	799.95	2319.05
T4	4	4	342.31	501.81	679.75	814.70	2313.85
		10	357.94	501.08	642.50	766.80	2253.65
		13	317.36	531.35	690.50	717.95	2223.11
		18	333.97	537.96	705.00	846.16	2423.26
T5	5	5	317.79	497.19	695.19	812.43	2333.24
		9	339.61	519.96	652.29	820.05	2329.62
		15	310.77	535.44	717.61	836.44	2429.94
		20	291.87	508.63	701.17	767.61	2263.17



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

Tab. No. 9c

Treatment	Tr. No.	Box No.	Feed conversion ratio			
			Day 14	Day 21	Day 28	Day 35
			g/kg LW	g/kg LW	g/kg LW	g/kg LW
T1	1	1	1172.36	1215.53	1286.63	1353.57
		6	1209.50	1214.79	1257.62	1353.89
		12	1201.02	1249.92	1305.49	1423.00
		16	1183.37	1195.57	1277.87	1374.02
T2	2	2	1125.14	1256.28	1360.09	1448.25
		7	1246.53	1291.34	1384.83	1507.64
		11	1186.38	1218.61	1293.21	1423.77
		17	1212.62	1205.07	1282.99	1374.61
T3	3	3	1210.43	1264.85	1316.14	1363.23
		8	1214.63	1253.46	1311.79	1405.36
		14	1219.40	1274.18	1330.84	1408.97
		19	1231.58	1247.40	1292.44	1381.33
T4	4	4	1203.62	1230.66	1292.38	1367.95
		10	1212.87	1259.65	1323.74	1413.89
		13	1196.51	1229.48	1271.13	1378.89
		18	1195.67	1247.58	1291.18	1377.90
T5	5	5	1166.44	1210.32	1256.30	1339.63
		9	1147.56	1209.97	1286.83	1388.44
		15	1198.27	1240.78	1280.00	1366.98
		20	1285.35	1260.64	1316.87	1376.62

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

Tab. No. 9d

Treatment	Tr. No.	Box No.	Feed consumption per 1 kg of weight gain				
			1-14 days	15-21 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	1335.80	1267.46	1908.24	1523.82	1399.61
		6	1375.72	1220.90	1749.69	1631.04	1399.32
		12	1363.07	1305.49	1543.93	1873.52	1473.51
		16	1350.02	1208.93	1814.41	1662.26	1421.80
T2	2	2	1277.98	1425.98	1889.04	1728.30	1503.16
		7	1415.65	1347.70	2093.51	1899.36	1564.36
		11	1346.26	1256.72	1777.43	1850.63	1473.25
		17	1386.55	1197.20	1855.18	1628.43	1420.24
T3	3	3	1366.26	1326.64	1997.37	1480.60	1405.98
		8	1381.41	1300.35	1899.74	1680.37	1455.50
		14	1396.06	1334.36	1727.09	1658.45	1460.50
		19	1400.06	1264.57	1848.22	1625.10	1425.78
T4	4	4	1364.25	1263.42	1813.05	1576.04	1413.72
		10	1371.69	1317.44	1918.71	1674.49	1462.43
		13	1362.36	1265.70	1613.37	1747.03	1426.94
		18	1361.90	1305.28	1846.96	1618.46	1423.90
T5	5	5	1330.40	1260.05	1755.06	1561.46	1383.47
		9	1301.23	1280.80	2008.72	1658.44	1433.51
		15	1370.50	1287.45	1797.67	1619.29	1414.68
		20	1490.37	1233.73	1623.42	1553.16	1428.38

Feed consumption per box

Tab. No. 9e

Treatment	Tr. No.	Box No.	Feed consumption				
			Starter (1-14 days)	Grower (15-21 days)	Grower (22-28 days)	Finisher (29-35 days)	Total
			kg	kg	kg	kg	kg
T1	1	1	18.78	16.88	19.36	25.62	80.64
		6	19.82	17.36	19.74	25.64	82.56
		12	19.80	18.94	20.46	22.16	81.36
		16	18.98	17.70	19.78	24.50	80.96
T2	2	2	18.44	18.06	19.00	22.20	77.70
		7	20.66	17.76	19.16	24.76	82.34
		11	19.58	17.54	20.68	25.30	83.10
		17	19.14	18.14	20.82	26.62	84.72
T3	3	3	20.80	20.08	19.66	27.32	87.86
		8	19.92	17.66	18.68	24.52	80.78
		14	19.08	19.00	18.80	22.20	79.08
		19	20.06	18.98	20.50	27.30	86.84
T4	4	4	20.24	17.54	20.20	25.68	83.66
		10	20.74	18.24	19.70	25.68	84.36
		13	19.46	18.74	19.62	23.26	81.08
		18	19.20	18.86	19.52	26.02	83.60
T5	5	5	18.74	17.86	20.46	26.64	83.70
		9	19.24	18.92	20.72	28.56	87.44
		15	18.88	18.48	18.54	24.38	80.28
		20	18.50	16.30	18.96	21.46	75.22