



# MEZINÁRODNÍ TESTOVÁNÍ DRŮBEŽE ÚSTRAŠICE

státní podnik

390 02 Tábor 2

Česká republika

**Effects of reduced crude protein content with balanced aminoacid  
profil into broiler diets on live performance and slaughter  
parameters**

**Trial No. 13 53 22003 (No. 1234)**

**Vliv sníženého obsahu bílkovin s vyváženými aminokyselinami  
v krmení na zdraví a užitkovost brojlerových kuřat**

Test č. 13 53 22003 (VT č. 1234)

**International Poultry Testing Station Ústrašice  
Mezinárodní testování drůbeže Ústrašice**

**Czech Republic  
Česká republika**

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Zpracovatel studie:

**Ing. Jan Tyl**

**Associate Investigator:**  
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Ing. Hana Koželuhová  
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**Study monitor:**  
Dohlížitel:

xxxxx

**Study sponsor :**  
Dohlížitel:

xxxxx

**January 2023  
Leden 2023**

## **Aim of the Project**

Effects of reduced crude protein content with balanced aminoacid profil into broiler diets on live performance and slaughter parameters.

## **Study location**

The study was carried out on the test facility Mezinárodní testování drůbeže, s.p., (next MTD, s.p. only), Ústřašice, Czech Republic. Feed samples were sended for the contents of nutrients by xxxxx.

## **Trial period**

Beginning of the trial:	25 October 2022
End of the trial:	29 November 2022

## **Study responsibility**

Ing. Jan Tyl was the independent Study Director, responsible that the trial is conducted according to the protocol. Ing. Hana Horná was responsible for daily animal care at the test facility. Full details of study's responsibility are provided below.

## **Persons involved in the trial**

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## **Material and methods**

### **Birds**

In total there were 8400 day old chicks of xxxxx. Day-old chicks were randomly distributed into 6 dietary treatments with 10 replicates per treatment and 140 chicken per replicate.

Origin 1-day old chicks:

breeder company – xxxxx

parent flock – xxxxx

age of the breeding flock – 32 weeks

### **Experimental treatments:**

<b>Tr. No.</b>	<b>Tr.</b>	<b>Description</b>	<b>No. of pen</b>	<b>No. of chick</b>
1	T1	xxxxx	140	1400
2	T2	xxxxx	140	1400
3	T3	xxxxx	140	1400
4	T4	xxxxx	140	1400
5	T5	xxxxx	140	1400
6	T6	xxxxx	140	1400

### **Housing system**

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

Light was provided as follows during the experimental period:

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: 17,2 broilers per square meter

The conduct of the trial was conformed to the national welfare legislation.

### **Veterinary precautions**

The chicken house was disinfected with xxxxx before the chick placement.

On days 1 and 12 the chicken were vaccinated with xxxxx. On the first days old chickens was applied the water solution of permanganate.

### **Feeds and Diets**

Chickens were fed ad libitum according to three phase feeding programme. The test phases were 0-8 days of age for the starter BR1, 9-16 days of age for the grower BR2-1, 17-24 days of age for the grower BR2-2 and 25-35 days of age for the finisher BR3.

Feed was produced by International Poultry Testing Station Ústrašice. The composition of diets is shown in following tables.

## Composition of the feed

Ingredients (%)	T1-T6	T1	T2-T6	T1	T2, T3	T4, T5,T6
	Starter	Grower 1 20.5	Grower 1 19.5	Grower 2 20.0	Grower 2 19.0	Grower 2 18.0
Corn	40.80	46.72	50.89	37.10	40.93	44.76
Wheat	20.50	15.50	15.50	25.50	25.50	25.50
Soyabean meal	25.83	27.46	21.35	25.55	21.48	17.40
Soy Concentrate 60	3.00	-	-	-	-	-
Rapeseed meal	2.00	2.00	3.86	3.00	3.27	3.54
Rapeseed, full fat	2.00	2.69	2.00	3.00	3.00	3.00
Soyabean oil	1.39	1.35	1.00	2.30	1.65	1.00
Limestone	1.64	1.43	1.47	1.47	1.49	1.50
Salt	0.20	0.23	0.19	0.36	0.36	0.35
Rucana-Ca-Na-P	0.42	0.35	0.24	0.27	0.29	0.31
Potassium chloride	-	-	0.21	-	-	-
Monocalciumphosphate	-	-	0.14	-	-	-
xxxxx	1.71	1.77	2.67	0.95	1.54	2.14
AMV BR1 plus	0.50	-	-	-	-	-
AMV BR2 plus	-	0.50	0.50	0.50	0.50	0.50
AMV BR3 plus	-	-	-	-	-	-

Ingredients (%)	T1	T2	T3, T4	T5	T6
	Finisher 19.0	Finisher 18.5	Finisher 18.0	Finisher 17.5	Finisher 17.0
Corn	40.20	41.00	43.05	45.00	46.45
Wheat	25.29	25.27	25.50	25.20	25.21
Soyabean meal	21.28	20.32	17.45	15.44	13.62
Soy Concentrate 60	-	-	-	-	-
Rapeseed meal	3.50	3.67	4.17	4.51	4.84
Rapeseed, full fat	3.50	3.50	3.50	3.50	3.50
Soyabean oil	1.97	1.85	1.49	1.24	1.00
Limestone	1.20	1.20	1.20	1.20	1.20
Salt	0.36	0.36	0.35	0.35	0.35
Rucana-Ca-Na-P	-	-	-	-	-
Potassium chloride	-	-	-	-	-
Monocalciumphosphate	1.10	1.10	1.15	1.15	1.16
xxxxx	1.11	1.24	1.64	1.90	2.17
AMV BR1 plus	-	-	-	-	-
AMV BR2 plus	-	-	-	-	-
AMV BR3 plus	0.50	0.50	0.50	0.50	0.50

## **Parameters recorded and methods applied**

### **Live weight**

Live weight was measured on day 1 and on day 8 (the birds in each pen were weighed altogether). On day 16 and 24 of age birds were weighed individually, without fasting. On day 35 birds were weighed individually, after 12 hours of fasting.

### **Feed consumption**

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

### **Weight gain**

Weight gain per phase and average daily weight gains were calculated for the periods 1 – 8 days, 9 – 16 days, 17 – 24 days, 25 – 35 days and for the overall experiment (1 – 35 days).

### **Feed conversion ratio**

Feed conversion ratio was calculated as feed consumption per 1 kg of live weight and per 1 kg of weight gain for the periods 1 – 8 days, 9 – 16 days, 17 – 24 days, 25 – 35 days and for the overall experiment (1 – 35 days). The calculation was included weight of deaths.

### **Mortality**

All pens were checked three times a day to see if there were any dead or ill birds. Dead chickens were registered by date, weight and reason of mortality on the day of death. Mortality was recorded for the periods 1 – 8 days, 9 – 16 days, 17 – 24 days, 25 – 35 days and 1 – 35 days.

### **Foot pad lesions**

One third of the animals were recorded at the end of the feeding trial according the scale.

### **Statistical analyses**

Performance results of live weight (on days 1, 8, 16, 24 and 35) 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.	<b>1 Hatchability</b>
	<b>2 Performance results:</b>
	<b>2a Body weight</b>
	<b>2b Weight gain</b>
	<b>2c Feed conversion per 1 kg of live weight</b>
	<b>2d Feed conversion per 1 kg of weight gain</b>
	<b>2e Feed consumption</b>
	<b>3 Mortality</b>
	<b>4 Carcass analysis</b>
	<b>5 Foot pad lesions</b>
	<b>6 Statistical analysis of body weight at the age of 35 days</b> (average body weight, standard deviation, coefficient of variation)
	<b>7 - 8 Statistical analyses of performance results</b>
	<b>9 Performance results per pen:</b>
	<b>9a Body weight</b>
	<b>9b Weight gain</b>
	<b>9c Feed conversion per 1 kg of live weight</b>
	<b>9d Feed conversion per 1 kg of weight gain</b>
	<b>9e Feed consumption</b>
	<b>9f Foot pad lesions</b>



**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	92.80	89.40	96.40	1400	55.56	36.93
T2	2				1400		36.93
T3	3				1400		36.93
T4	4				1400		36.89
T5	5				1400		36.89
T6	6				1400		36.89

**Body weight per phases**

**Tab. No. 2a**

Treatment	Tr. No.	Day 1		Day 8		Day 16		Day 24		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	1400	36.93	1370	155.98	1341	414.22	1311	826.25	1291	1612.91
T2	2	1400	36.93	1381	156.91	1364	424.08	1331	867.61	1308	1657.22
T3	3	1400	36.93	1381	155.51	1351	425.63	1333	859.24	1310	1619.28
T4	4	1400	36.89	1382	154.11	1362	428.25	1330	859.48	1305	1587.79
T5	5	1400	36.89	1381	154.71	1372	425.58	1343	831.84	1318	1576.89
T6	6	1400	36.89	1382	156.40	1360	428.24	1325	854.65	1304	1617.19

**Weight gain per phases**

**Tab. No. 2b**

Treatment	Tr. No.	Day 1 - 8		Day 9 - 16		Day 17 - 24		Day 25 - 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	119.05	14.88	258.24	32.28	412.03	51.50	786.66	65.55	1575.98	43.78
T2	2	119.99	15.00	267.17	33.40	443.53	55.44	789.61	65.80	1620.29	45.01
T3	3	118.58	14.82	270.12	33.76	433.61	54.20	760.04	63.34	1582.35	43.95
T4	4	117.22	14.65	274.14	34.27	431.23	53.90	728.30	60.69	1550.89	43.08
T5	5	117.82	14.73	270.87	33.86	406.26	50.78	745.05	62.09	1540.00	42.78
T6	6	119.51	14.94	271.83	33.98	426.41	53.30	762.54	63.54	1580.29	43.90

**Feed conversion per 1 kg of live weight**

**Tab. No. 2c**

Treatment	Tr. No.	Feed conversion ratio			
		Day 8	Day 16	Day 24	Day 35
		g/kg live weight	g/kg live weight	g/kg live weight	g/kg live weight
T1	1	1036.13	1117.44	1282.44	1546.37
T2	2	1030.09	1117.99	1226.62	1517.31
T3	3	999.49	1095.71	1225.53	1521.94
T4	4	1038.16	1085.23	1217.75	1526.25
T5	5	1032.44	1083.14	1246.04	1534.75
T6	6	974.11	1058.26	1228.44	1522.07

**Feed conversion per 1 kg of weight gain**

**Tab. No. 2d**

Treatment	Tr. No.	Feed conversion ratio				
		Day 1-8	Day 9-16	Day 17-24	Day 25-35	Day 1-35
		g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain
T1	1	1363.33	1167.79	1454.29	1833.20	1585.01
T2	2	1350.82	1170.46	1334.04	1846.33	1553.71
T3	3	1314.18	1152.35	1356.11	1868.60	1559.35
T4	4	1368.19	1112.18	1353.32	1904.31	1564.51
T5	5	1359.43	1112.39	1421.05	1868.32	1573.18
T6	6	1277.98	1107.69	1404.83	1862.20	1559.56

**Feed consumption per phases**

**Tab. No. 2e**

Treatment	Tr. No.	Feed consumption				
		Starter (d 1-8)	Grower (d 9-16)	Grower (d 17-24)	Finisher (d 25-35)	Total (d 1-35)
		kg	kg	kg	kg	kg
T1	1	223.20	406.30	786.60	1862.60	3278.70
T2	2	224.30	427.00	785.90	1911.20	3348.40
T3	3	215.80	422.60	785.50	1856.40	3280.30
T4	4	222.30	415.95	778.00	1807.20	3223.45
T5	5	221.70	414.10	776.40	1832.70	3244.90
T6	6	211.60	409.60	795.60	1854.20	3271.00

**Mortality**

**Tab. No. 3**

Treatment	Tr. No.	Mortality in the period											Mortality according causes														
		Day 1 - 8		Day 9 - 16		Day 17 - 24		Day 25 - 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	30	1727	29	6143	30	13134	20	16988	109	37992	7.79										66	15		11	17	
T2	2	19	1048	17	3063	33	12773	23	22282	92	39166	6.57										51	9		9	23	
T3	3	19	1160	30	6448	18	8891	23	17580	90	34079	6.43										59	3		9	19	
T4	4	18	1129	20	3714	32	15053	25	20057	95	39953	6.79										58	3		6	28	
T5	5	19	1085	9	2020	29	13087	25	19757	82	35949	5.86										50	3		7	22	
T6	6	18	1075	22	3529	35	16320	21	19306	96	40230	6.86										63	7		7	19	

**Causes:**

- 1 - Viral diseases
- 2 - Bacterial diseases
- 3 - Fungal diseases
- 4 - Parasitary diseases
- 5 - Tumors

- 6 - Injuries
- 7 - Digestive tract diseases
- 8 - Respiratory tract diseases
- 9 - Reproduction tract diseases
- 10 - Locomotion apparatus diseases

- 11 - Sudden death syndrome
- 12 - Cannibalism
- 13 - Diverticulus inflammation
- 14 - Culling and other causes
- 15 - Sampling (excluded of calculation)

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	♂	1834	1251	122	16	0.87	398	21.68	31.79	389	21.21	31.10	787	42.90	62.89	68.21	74.84
		♀	1587	1065	107	16	0.99	327	20.58	30.68	329	20.70	30.85	655	41.29	61.54	67.09	73.84
		♂	<b>1711</b>	<b>1158</b>	<b>114</b>	<b>16</b>	<b>0.92</b>	<b>362</b>	<b>21.17</b>	<b>31.28</b>	<b>359</b>	<b>20.98</b>	<b>30.99</b>	<b>721</b>	<b>42.15</b>	<b>62.27</b>	<b>67.69</b>	<b>74.37</b>
T2	2	♂	1813	1228	126	18	1.00	370	20.43	30.17	390	21.54	31.80	761	41.96	61.97	67.71	74.68
		♀	1648	1114	114	15	0.93	347	21.05	31.12	339	20.59	30.44	686	41.64	61.56	67.64	74.55
		♂	<b>1730</b>	<b>1171</b>	<b>120</b>	<b>17</b>	<b>0.96</b>	<b>359</b>	<b>20.72</b>	<b>30.62</b>	<b>365</b>	<b>21.09</b>	<b>31.16</b>	<b>723</b>	<b>41.81</b>	<b>61.78</b>	<b>67.68</b>	<b>74.62</b>
T3	3	♂	1767	1190	123	18	0.99	357	20.22	30.03	379	21.45	31.86	736	41.67	61.88	67.33	74.27
		♀	1583	1068	110	16	1.00	313	19.75	29.28	338	21.36	31.66	651	41.11	60.94	67.46	74.39
		♂	<b>1675</b>	<b>1129</b>	<b>116</b>	<b>17</b>	<b>0.99</b>	<b>335</b>	<b>20.00</b>	<b>29.67</b>	<b>359</b>	<b>21.41</b>	<b>31.76</b>	<b>694</b>	<b>41.40</b>	<b>61.44</b>	<b>67.39</b>	<b>74.32</b>
T4	4	♂	1746	1164	122	17	0.98	341	19.55	29.32	372	21.33	32.00	714	40.87	61.32	66.66	73.67
		♀	1570	1061	108	15	0.99	320	20.37	30.13	332	21.16	31.31	652	41.53	61.44	67.59	74.45
		♂	<b>1658</b>	<b>1113</b>	<b>115</b>	<b>16</b>	<b>0.98</b>	<b>331</b>	<b>19.93</b>	<b>29.71</b>	<b>352</b>	<b>21.25</b>	<b>31.67</b>	<b>683</b>	<b>41.18</b>	<b>61.38</b>	<b>67.10</b>	<b>74.04</b>
T5	5	♂	1733	1156	124	16	0.93	335	19.33	28.96	374	21.59	32.36	709	40.92	61.32	66.73	73.87
		♀	1566	1047	110	16	0.99	301	19.23	28.77	342	21.83	32.67	643	41.06	61.44	66.83	73.87
		♂	<b>1650</b>	<b>1102</b>	<b>117</b>	<b>16</b>	<b>0.96</b>	<b>318</b>	<b>19.28</b>	<b>28.87</b>	<b>358</b>	<b>21.71</b>	<b>32.50</b>	<b>676</b>	<b>40.99</b>	<b>61.38</b>	<b>66.78</b>	<b>73.87</b>
T6	6	♂	1780	1185	126	19	1.05	343	19.25	28.92	385	21.63	32.49	728	40.88	61.41	66.57	73.67
		♀	1600	1080	112	15	0.96	311	19.44	28.79	340	21.28	31.52	651	40.72	60.31	67.51	74.48
		♂	<b>1690</b>	<b>1132</b>	<b>119</b>	<b>17</b>	<b>1.01</b>	<b>327</b>	<b>19.34</b>	<b>28.86</b>	<b>363</b>	<b>21.46</b>	<b>32.03</b>	<b>689</b>	<b>40.80</b>	<b>60.89</b>	<b>67.01</b>	<b>74.05</b>



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

<b>Treatment</b>	<b>Tr. No.</b>	<b>Evaluation</b>	
		<b>right foot</b>	<b>left foot</b>
T1	1	1.27	1.23
T2	2	1.30	1.34
T3	3	1.30	1.33
T4	4	1.21	1.23
T5	5	1.12	1.18
T6	6	1.28	1.26

**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	634	1734.87	213.36	12.30	657	1495.22	209.90	14.04
T2	2	653	1759.49	212.36	12.07	655	1555.25	202.08	12.99
T3	3	642	1746.93	207.29	11.87	668	1496.60	203.60	13.60
T4	4	646	1697.65	230.18	13.56	659	1480.09	210.80	14.24
T5	5	642	1698.44	220.18	12.96	676	1461.45	197.88	13.54
T6	6	643	1726.72	209.89	12.16	661	1510.64	228.05	15.10

### 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. 7a**

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	36.93	0.25		o	o	o	o	o
T2	2	10	36.93	0.25	1.000000		o	o	o	o
T3	3	10	36.93	0.25	1.000000	1.000000		o	o	o
T4	4	10	36.89	0.24	0.779505	0.773372	0.764319		o	o
T5	5	10	36.89	0.24	0.786171	0.779505	0.773372	1.000000		o
T6	6	10	36.89	0.24	0.773372	0.764319	0.748492	1.000000	1.000000	

**Body weight - day 8**

**Tab. No. 7b**

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	155.98	3.54		o	o	o	o	o
T2	2	10	156.91	3.54	0.672953		o	o	o	o
T3	3	10	155.51	5.57	0.819572	0.540813		o	o	o
T4	4	10	154.11	6.45	0.413117	0.239817	0.524457		o	o
T5	5	10	154.71	4.22	0.563372	0.347449	0.696982	0.771250		o
T6	6	10	156.40	3.28	0.838510	0.804593	0.686185	0.328157	0.459382	

**Body weight - day 16**

**Tab. No. 7c**

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Kruskal-Wallis test					
					T1	T2	T3	T4	T5	T6
T1	1	1341	414.22	73.58		***	***	***	***	***
T2	2	1364	424.08	64.48	0.000008		o	o	o	o
T3	3	1351	425.63	64.90	0.000021	1.000000		o	o	o
T4	4	1362	428.25	70.92	0.000000	1.000000	1.000000		o	o
T5	5	1372	425.58	70.11	0.000001	1.000000	1.000000	1.000000		o
T6	6	1360	428.24	73.16	0.000000	1.000000	1.000000	1.000000	1.000000	

**Body weight - day 24**

**Tab. No. 7d**

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Kruskal-Wallis test					
					T1	T2	T3	T4	T5	T6
T1	1	1311	826.25	140.29		***	***	***	o	***
T2	2	1331	867.61	125.96	0.000000		o	o	***	o
T3	3	1333	859.24	142.97	0.000000	0.198861		o	***	o
T4	4	1330	859.48	141.26	0.000000	0.454401	1.000000		***	o
T5	5	1343	831.84	134.77	0.918371	0.000000	0.000159	0.000036		***
T6	6	1325	854.65	133.61	0.000000	0.062174	1.000000	1.000000	0.000763	

**Body weight - day 35**

**Tab. No. 7e**

Treatment	Treat. No.	No. of birds	Average (g)	Standard deviation	Scheffe test					
					T1	T2	T3	T4	T5	T6
T1	1	1291	1612.91	243.12		***	o	o	*	o
T2	2	1308	1657.22	231.01	0.000535		0.006253	***	***	**
T3	3	1310	1619.28	240.49	0.993688	0.006253		*	**	o
T4	4	1305	1587.79	245.91	0.216299	0.000000	0.048111		o	o
T5	5	1318	1576.89	240.22	0.012352	0.000000	0.001086	0.930582		**
T6	6	1304	1617.19	244.39	0.999068	0.002928	0.999971	0.083854	0.002568	

**FCR - day 8**

**Tab. No. 8a**

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	1037.40	94.36		o	o	o	o	o
T2	2	10	1031.07	82.70	0.862118		o	o	o	o
T3	3	10	999.95	72.17	0.321470	0.362404		o	o	o
T4	4	10	1038.03	38.81	0.985466	0.855257	0.325585		o	o
T5	5	10	1032.88	73.93	0.894461	0.957562	0.365482	0.888039		o
T6	6	10	974.38	80.48	0.102273	0.119346	0.453476	0.104971	0.120512	

**FCR - day 16**

**Tab. No. 8b**

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	1128.26	121.73		o	o	o	o	o
T2	2	10	1120.64	73.95	0.847610		o	o	o	o
T3	3	10	1099.16	75.84	0.492036	0.588047		o	o	o
T4	4	10	1089.83	83.04	0.382314	0.466998	0.814026		o	o
T5	5	10	1087.35	67.76	0.364295	0.449240	0.780600	0.950050		o
T6	6	10	1065.54	95.27	0.170733	0.220951	0.444823	0.566300	0.582445	

FCR - day 24

Tab. No. 8c

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	1285.15	52.35		o	o	o	o	o
T2	2	10	1229.14	62.22	0.088587		o	o	o	o
T3	3	10	1230.10	88.54	0.086634	0.973643		o	o	o
T4	4	10	1222.16	73.90	0.059411	0.809990	0.798156		o	o
T5	5	10	1247.59	40.79	0.199163	0.567568	0.573357	0.441911		o
T6	6	10	1231.29	58.82	0.082961	0.945578	0.967538	0.777724	0.575083	

FCR - day 35

Tab. No. 8d

Treatment	Treat. No.	No. of box	Average (g)	Standard deviation	Duncan test					
					T1	T2	T3	T4	T5	T6
T1	1	10	1548.93	53.10		o	o	o	o	o
T2	2	10	1517.59	19.77	0.075880		o	o	o	o
T3	3	10	1522.21	28.49	0.124202	0.763295		o	o	o
T4	4	10	1527.62	38.67	0.193531	0.555787	0.741182		o	o
T5	5	10	1535.39	25.73	0.378804	0.307204	0.438533	0.612556		o
T6	6	10	1522.90	28.22	0.125120	0.745884	0.963898	0.758236	0.445914	

**Performance results per replicate**

**Body weight per phases**

**Tab. No. 9a (page 1)**

Treatment	Tr. No.	Pen	Day 1		Day 8		Day 16		Day 24		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	140	36.79	137	156.20	137	396.50	135	781.11	132	1608.79
		7	140	36.43	139	156.83	137	418.10	137	866.64	137	1704.01
		13	140	36.79	135	149.26	128	400.70	124	809.60	120	1590.92
		19	140	37.14	137	161.31	127	346.61	123	777.40	122	1519.84
		25	140	37.14	133	160.08	132	435.91	128	870.16	128	1655.63
		36	140	36.79	138	153.26	137	487.88	134	831.04	133	1635.41
		42	140	37.14	138	154.35	138	407.75	135	810.37	133	1574.66
		48	140	37.14	138	156.52	135	438.74	135	849.48	133	1657.82
		54	140	36.79	137	158.39	134	368.88	132	770.23	127	1529.84
		60	140	37.14	138	153.62	136	435.66	128	894.84	126	1638.81
T2	2	2	140	36.79	139	156.83	137	406.06	136	844.78	135	1680.22
		8	140	36.43	139	158.99	134	432.76	131	892.14	131	1679.24
		14	140	36.79	139	157.55	137	397.08	131	810.15	127	1593.86
		20	140	37.14	139	154.68	137	416.42	136	878.82	131	1667.25
		26	140	37.14	136	148.16	135	412.44	129	817.75	129	1604.73
		35	140	36.79	133	160.90	133	485.04	133	955.26	132	1672.27
		41	140	37.14	140	157.86	138	407.54	136	846.47	134	1606.49
		47	140	37.14	138	158.70	138	433.70	132	874.09	131	1712.14
		53	140	36.79	139	159.35	136	414.56	131	853.05	126	1660.48
		59	140	37.14	139	156.12	139	436.83	136	901.40	132	1692.95
T3	3	3	140	36.79	139	152.16	135	407.26	132	796.52	129	1595.27
		9	140	36.43	137	158.76	134	411.12	134	848.21	131	1619.85
		15	140	36.79	139	159.71	135	407.70	133	843.76	131	1587.25
		21	140	37.14	137	161.31	136	413.75	133	837.22	132	1610.15
		27	140	37.14	139	154.68	135	432.44	134	846.87	133	1620.15
		34	140	36.79	137	157.66	136	492.94	133	840.75	130	1622.77
		40	140	37.14	139	143.53	134	401.19	132	991.52	131	1645.11
		46	140	37.14	139	159.35	137	428.03	135	830.59	132	1616.52
		52	140	36.79	137	149.64	135	422.07	134	858.06	131	1595.34
		58	140	37.14	138	158.33	134	439.18	133	900.08	130	1680.62



Performance results per replicate

Body weight per phases

Tab. No. 9a (page 2)

Treatment	Tr. No.	Pen	Day 1		Day 8		Day 16		Day 24		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		
T4	4	4	140	36.79	137	145.26	137	391.97	135	810.81	134	1533.88
		10	140	36.43	139	160.43	138	402.10	134	874.18	130	1609.62
		16	140	36.79	138	159.78	136	409.63	136	859.34	133	1573.91
		22	140	37.14	137	160.22	131	406.56	123	782.68	120	1535.58
		28	140	37.14	137	155.47	133	422.18	125	834.96	123	1591.79
		33	140	36.79	138	147.10	138	454.49	135	848.37	132	1478.56
		39	140	37.14	139	152.16	137	490.29	135	975.04	133	1623.91
		45	140	37.14	140	161.79	137	439.64	137	861.31	134	1613.21
		51	140	36.79	139	153.24	137	424.53	134	843.43	130	1620.62
		57	140	36.79	138	145.65	138	439.78	136	895.74	136	1690.29
T5	5	5	140	36.79	140	153.57	140	408.14	140	843.14	136	1577.50
		11	140	36.43	139	156.47	138	395.07	135	792.81	132	1517.95
		17	140	36.79	136	150.37	136	397.94	134	847.31	131	1573.66
		23	140	37.14	138	147.83	138	415.72	133	843.98	130	1564.31
		29	140	37.14	139	150.00	138	408.91	130	829.38	128	1561.88
		32	140	36.79	137	161.31	137	471.82	134	804.18	131	1581.22
		38	140	37.14	140	157.86	139	483.67	134	840.15	134	1575.60
		44	140	37.14	139	156.83	138	425.65	137	819.85	134	1553.96
		50	140	36.79	135	157.78	131	399.16	129	790.39	129	1581.16
		56	140	36.79	138	155.07	137	448.25	137	904.09	133	1680.68
T6	6	6	140	36.79	140	152.14	138	409.78	136	850.44	135	1656.52
		12	140	36.43	138	158.70	138	379.57	135	820.30	133	1545.26
		18	140	36.79	139	155.40	136	380.00	132	843.11	130	1552.38
		24	140	37.14	136	156.62	135	451.56	133	855.64	133	1665.71
		30	140	37.14	139	159.71	133	424.74	128	827.97	124	1604.11
		31	140	36.79	139	156.47	137	493.43	135	900.22	134	1632.31
		37	140	37.14	140	152.86	139	493.24	137	941.90	132	1677.50
		43	140	37.14	137	160.22	135	397.41	130	813.08	130	1558.38
		49	140	36.79	135	151.85	131	423.05	129	816.28	123	1580.73
		55	140	36.79	139	160.07	138	428.33	130	872.08	130	1694.00

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

Tab. No. 9b (page 1)

Treatment	Tr. No.	Box	Day 1 - 8		Day 9 - 16		Day 17 - 24		Day 25 - 35		Day 1 - 35	
			WG	DWG	WG	DWG	WG	DWG	WG	DWG	WG	DWG
			g	g	g	g	g	g	g	g	g	g
T1	1	1	119.41	14.93	240.29	30.04	384.61	48.08	827.68	68.97	1572.00	43.67
		7	120.40	15.05	261.27	32.66	448.54	56.07	837.37	69.78	1667.58	46.32
		13	112.47	14.06	251.44	31.43	408.89	51.11	781.32	65.11	1554.13	43.17
		19	124.17	15.52	185.30	23.16	430.78	53.85	742.44	61.87	1482.70	41.19
		25	122.94	15.37	275.83	34.48	434.25	54.28	785.47	65.46	1618.49	44.96
		36	116.47	14.56	334.62	41.83	343.16	42.90	804.37	67.03	1598.62	44.41
		42	117.21	14.65	253.41	31.68	402.62	50.33	764.29	63.69	1537.52	42.71
		48	119.38	14.92	282.22	35.28	410.74	51.34	808.34	67.36	1620.68	45.02
		54	121.60	15.20	210.49	26.31	401.35	50.17	759.62	63.30	1493.05	41.47
		60	116.48	14.56	282.04	35.25	459.18	57.40	743.97	62.00	1601.67	44.49
T2	2	2	120.04	15.01	249.22	31.15	438.72	54.84	835.44	69.62	1643.43	45.65
		8	122.56	15.32	273.77	34.22	459.38	57.42	787.10	65.59	1642.81	45.63
		14	120.76	15.10	239.53	29.94	413.07	51.63	783.71	65.31	1557.07	43.25
		20	117.54	14.69	261.75	32.72	462.40	57.80	788.43	65.70	1630.11	45.28
		26	111.02	13.88	264.28	33.04	405.31	50.66	786.98	65.58	1567.59	43.54
		35	124.11	15.51	324.14	40.52	470.23	58.78	717.01	59.75	1635.48	45.43
		41	120.72	15.09	249.68	31.21	438.93	54.87	760.02	63.34	1569.35	43.59
		47	121.56	15.19	275.00	34.38	440.40	55.05	838.05	69.84	1675.00	46.53
		53	122.56	15.32	255.21	31.90	438.49	54.81	807.42	67.29	1623.69	45.10
		59	118.98	14.87	280.72	35.09	464.56	58.07	791.56	65.96	1655.81	45.99
T3	3	3	115.37	14.42	255.10	31.89	389.26	48.66	798.76	66.56	1558.48	43.29
		9	122.33	15.29	252.36	31.55	437.09	54.64	771.64	64.30	1583.42	43.98
		15	122.92	15.37	247.99	31.00	436.06	54.51	743.49	61.96	1550.46	43.07
		21	124.17	15.52	252.44	31.55	423.47	52.93	772.93	64.41	1573.01	43.69
		27	117.54	14.69	277.77	34.72	414.42	51.80	773.28	64.44	1583.01	43.97
		34	120.87	15.11	335.28	41.91	347.81	43.48	782.02	65.17	1585.98	44.05
		40	106.39	13.30	257.67	32.21	590.32	73.79	653.60	54.47	1607.97	44.67
		46	122.21	15.28	268.68	33.58	402.56	50.32	785.92	65.49	1579.38	43.87
		52	112.85	14.11	272.44	34.05	435.99	54.50	737.28	61.44	1558.55	43.29
		58	121.19	15.15	280.85	35.11	460.90	57.61	780.54	65.05	1643.48	45.65

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

Tab. No. 9b (page 2)

Treatment	Tr. No.	Box	Day 1 - 8		Day 9 - 16		Day 17 - 24		Day 25 - 35		Day 1 - 35	
			WG	DWG	WG	DWG	WG	DWG	WG	DWG	WG	DWG
			g	g	g	g	g	g	g	g	g	g
T4	4	4	108.47	13.56	246.72	30.84	418.84	52.36	723.07	60.26	1497.09	41.59
		10	124.00	15.50	241.67	30.21	472.08	59.01	735.44	61.29	1573.19	43.70
		16	122.99	15.37	249.85	31.23	449.71	56.21	714.57	59.55	1537.12	42.70
		22	123.08	15.38	246.35	30.79	376.12	47.01	752.90	62.74	1498.44	41.62
		28	118.33	14.79	266.71	33.34	412.78	51.60	756.83	63.07	1554.65	43.18
		33	110.31	13.79	307.39	38.42	393.88	49.23	630.19	52.52	1441.77	40.05
		39	115.02	14.38	338.13	42.27	484.75	60.59	648.87	54.07	1586.77	44.08
		45	124.65	15.58	277.85	34.73	421.68	52.71	751.90	62.66	1576.07	43.78
		51	116.45	14.56	271.29	33.91	418.91	52.36	777.18	64.77	1583.83	44.00
		57	108.86	13.61	294.13	36.77	455.95	56.99	794.56	66.21	1653.50	45.93
T5	5	5	116.78	14.60	254.57	31.82	435.00	54.38	734.36	61.20	1540.71	42.80
		11	120.04	15.01	238.60	29.82	397.74	49.72	725.14	60.43	1481.52	41.15
		17	113.58	14.20	247.57	30.95	449.37	56.17	726.35	60.53	1536.87	42.69
		23	110.69	13.84	267.90	33.49	428.26	53.53	720.32	60.03	1527.17	42.42
		29	112.86	14.11	258.91	32.36	420.47	52.56	732.49	61.04	1524.74	42.35
		32	124.52	15.57	310.51	38.81	332.35	41.54	777.04	64.75	1544.43	42.90
		38	120.72	15.09	325.81	40.73	356.48	44.56	735.45	61.29	1538.46	42.73
		44	119.69	14.96	268.82	33.60	394.20	49.28	734.10	61.18	1516.82	42.13
		50	120.99	15.12	241.38	30.17	391.23	48.90	790.78	65.90	1544.37	42.90
		56	118.28	14.79	293.18	36.65	455.84	56.98	776.59	64.72	1643.89	45.66
T6	6	6	115.35	14.42	257.64	32.20	440.66	55.08	806.08	67.17	1619.73	44.99
		12	122.27	15.28	220.87	27.61	440.73	55.09	724.97	60.41	1508.83	41.91
		18	118.61	14.83	224.60	28.08	463.11	57.89	709.28	59.11	1515.59	42.10
		24	119.48	14.93	294.94	36.87	404.08	50.51	810.08	67.51	1628.57	45.24
		30	122.57	15.32	265.02	33.13	403.23	50.40	776.14	64.68	1566.97	43.53
		31	119.68	14.96	336.96	42.12	406.79	50.85	732.09	61.01	1595.52	44.32
		37	115.72	14.46	340.38	42.55	448.66	56.08	735.60	61.30	1640.36	45.57
		43	123.08	15.38	237.19	29.65	415.67	51.96	745.31	62.11	1521.24	42.26
		49	115.06	14.38	271.20	33.90	393.23	49.15	764.45	63.70	1543.94	42.89
		55	123.28	15.41	268.26	33.53	443.74	55.47	821.92	68.49	1657.21	46.03

**Feed conversion per 1 kg of live weight**

**Tab. No. 9c (page 1)**

Treatment	Tr. No.	Box	Feed conversion ratio			
			Day 8	Day 16	Day 24	Day 35
			g/kg live weight	g/kg live weight	g/kg live weight	g/kg live weight
T1	1	1	922.24	1156.01	1304.36	1502.99
		7	969.99	1131.34	1259.56	1484.46
		13	1251.96	1188.13	1312.61	1552.93
		19	1047.64	1368.72	1385.09	1675.91
		25	1046.47	1054.95	1269.21	1559.01
		36	1008.15	939.25	1261.15	1530.51
		42	984.74	1085.16	1281.88	1556.30
		48	1022.85	1045.09	1226.56	1505.32
		54	985.02	1256.13	1340.49	1572.91
		60	1134.98	1057.79	1210.56	1548.94
T2	2	2	1125.39	1259.58	1316.43	1522.36
		8	943.23	1084.29	1200.60	1483.26
		14	1101.85	1224.96	1311.73	1545.33
		20	1029.59	1132.15	1202.34	1511.98
		26	1124.53	1112.06	1274.38	1526.16
		35	950.37	1006.30	1113.54	1535.57
		41	972.85	1081.98	1238.48	1539.02
		47	1041.71	1111.24	1235.11	1511.56
		53	909.75	1126.30	1227.40	1504.19
		59	1111.42	1067.54	1171.39	1496.48
T3	3	3	896.40	1162.06	1374.80	1538.29
		9	993.26	1108.51	1229.59	1486.32
		15	1021.19	1177.06	1256.82	1545.89
		21	1064.88	1155.88	1283.35	1555.19
		27	1020.60	1126.69	1225.48	1510.89
		34	959.73	942.33	1273.54	1529.45
		40	1044.90	1121.57	1025.03	1469.72
		46	864.44	990.92	1236.33	1520.20
		52	1068.36	1123.71	1198.53	1554.66
		58	1065.82	1082.84	1197.56	1511.47

**Feed conversion per 1 kg of live weight**

**Tab. No. 9c (page 2)**

Treatment	Tr. No.	Box	Feed conversion ratio			
			Day 8	Day 16	Day 24	Day 35
			g/kg live weight	g/kg live weight	g/kg live weight	g/kg live weight
T4	4	4	1052.00	1193.65	1271.48	1539.68
		10	1079.27	1161.85	1207.35	1509.98
		16	1051.83	1113.82	1198.81	1508.85
		22	1058.25	1134.60	1347.89	1559.28
		28	1099.36	1120.23	1269.41	1554.40
		33	1000.05	934.43	1162.42	1554.32
		39	994.58	963.98	1083.21	1535.73
		45	997.79	1133.40	1255.24	1553.69
		51	992.46	1069.76	1256.33	1529.97
		57	1054.66	1072.62	1169.44	1430.34
T5	5	5	1000.00	1142.81	1230.09	1507.72
		11	990.19	1185.87	1308.01	1552.40
		17	1145.48	1136.87	1206.93	1531.70
		23	1132.70	1089.61	1224.07	1576.81
		29	893.50	1100.96	1246.64	1556.50
		32	1046.72	961.42	1280.54	1519.80
		38	1049.77	992.95	1264.68	1535.89
		44	1071.38	1098.01	1241.25	1528.58
		50	1003.93	1104.52	1296.66	1554.60
		56	995.16	1060.49	1177.00	1489.92
T6	6	6	934.27	1152.07	1216.54	1494.19
		12	904.18	1125.95	1238.51	1548.91
		18	827.21	1095.02	1204.31	1551.51
		24	1094.26	1078.81	1285.42	1556.37
		30	992.19	1138.19	1312.11	1543.66
		31	1082.72	934.10	1171.16	1497.68
		37	971.96	854.59	1111.36	1489.81
		43	958.58	1096.66	1262.73	1537.81
		49	1027.81	1078.13	1271.70	1522.82
		55	950.59	1101.90	1239.05	1486.27

Feed conversion per 1 kg of weight gain

Tab. No. 9d (page 1)

Treatment	Tr. No.	Box	Feed conversion ratio				
			Day 1-8	Day 9-16	Day 17-24	Day 25-35	Day 1-35
			g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain
T1	1	1	1211.39	1309.23	1458.74	1695.81	1539.54
		7	1265.23	1229.68	1379.98	1718.10	1517.56
		13	1673.49	1147.75	1441.43	1817.14	1594.37
		19	1365.51	1664.13	1399.53	1996.26	1723.12
		25	1376.39	1060.00	1494.45	1885.82	1597.85
		36	1331.14	907.49	1733.42	1815.26	1567.17
		42	1300.27	1146.70	1485.90	1857.24	1595.47
		48	1345.10	1057.69	1422.90	1803.04	1541.17
		54	1289.25	1463.28	1420.70	1821.30	1614.46
		60	1501.02	1014.75	1364.17	1980.69	1587.91
T2	2	2	1472.31	1345.57	1369.91	1732.30	1557.43
		8	1225.25	1169.07	1314.24	1810.69	1518.05
		14	1439.41	1307.15	1399.63	1800.47	1584.41
		20	1356.77	1193.69	1266.55	1869.19	1547.80
		26	1510.12	1104.96	1448.94	1794.72	1564.94
		35	1244.71	1034.56	1224.82	2101.89	1571.98
		41	1272.16	1151.96	1386.73	1881.23	1576.55
		47	1364.44	1151.52	1363.94	1807.12	1546.91
		53	1184.51	1264.84	1328.37	1815.81	1541.10
		59	1460.08	1043.05	1271.35	1880.57	1531.27
T3	3	3	1184.14	1325.37	1605.28	1708.50	1576.98
		9	1293.94	1182.75	1345.40	1776.31	1522.26
		15	1329.16	1278.92	1334.04	1884.59	1584.40
		21	1387.72	1215.14	1409.86	1857.17	1593.52
		27	1345.04	1187.44	1330.48	1829.51	1547.84
		34	1257.04	934.00	1756.06	1817.32	1567.11
		40	1411.93	1164.93	956.58	2164.47	1505.48
		46	1128.65	1067.21	1503.23	1832.02	1557.62
		52	1422.56	1154.83	1272.08	1985.60	1593.40
		58	1396.56	1092.75	1309.14	1887.63	1547.73

Feed conversion per 1 kg of weight gain

Tab. No. 9d (page 2)

Treatment	Tr. No.	Box	Feed conversion ratio				
			Day 1-8	Day 9-16	Day 17-24	Day 25-35	Day 1-35
			g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain	g/kg weight gain
T4	4	4	1413.20	1278.11	1345.62	1844.82	1578.81
		10	1398.74	1217.14	1247.24	1888.65	1546.77
		16	1368.71	1154.38	1276.98	1892.94	1546.39
		22	1383.60	1186.22	1598.03	1796.49	1602.66
		28	1450.75	1132.82	1430.90	1890.30	1595.30
		33	1337.85	902.88	1432.78	2098.88	1595.59
		39	1317.48	950.00	1206.70	2236.96	1573.12
		45	1295.10	1214.31	1383.07	1905.43	1591.50
		51	1307.80	1114.19	1450.93	1841.92	1567.50
		57	1415.72	1081.55	1264.35	1726.82	1462.98
T5	5	5	1315.03	1228.96	1311.99	1837.50	1544.31
		11	1292.35	1315.23	1432.20	1831.03	1592.19
		17	1525.16	1131.57	1270.17	1921.63	1570.21
		23	1518.09	1065.73	1359.98	2007.85	1617.28
		29	1188.86	1222.41	1394.87	1929.08	1596.84
		32	1361.82	916.78	1747.38	1777.57	1557.94
		38	1372.75	965.21	1650.61	1851.85	1574.25
		44	1406.13	1113.65	1398.22	1857.39	1567.11
		50	1318.00	1172.50	1499.60	1818.45	1594.40
		56	1308.60	1095.38	1292.23	1866.14	1524.43
T6	6	6	1232.24	1282.56	1277.25	1793.35	1529.03
		12	1176.90	1286.09	1337.40	1912.62	1587.84
		18	1085.61	1285.55	1296.51	1981.53	1591.38
		24	1441.89	1070.43	1520.86	1846.11	1593.53
		30	1294.34	1231.08	1503.67	1807.27	1583.78
		31	1417.72	864.12	1464.89	1905.55	1533.33
		37	1283.92	801.47	1398.08	1990.49	1524.49
		43	1253.22	1191.40	1429.89	1845.39	1577.78
		49	1365.63	1107.58	1486.66	1806.47	1562.65
		55	1236.05	1192.75	1381.03	1756.67	1521.30

Feed consumption per phases

Tab. No. 9e (page 1)

Treatment	Tr. No.	Box	Feed consumption				
			Starter (D 1-8)	Grower (D 9-16)	Grower (D 17-24)	Finisher (D 24-35)	Total (D 1-35)
			kg	kg	kg	kg	kg
T1	1	1	19.90	43.10	76.40	186.70	326.10
		7	21.20	44.10	84.80	197.10	347.20
		13	25.60	37.10	73.50	171.50	307.70
		19	23.40	40.40	74.00	180.30	318.10
		25	22.70	38.60	82.60	189.60	333.50
		36	21.40	41.80	79.50	194.30	337.00
		42	21.10	40.10	80.80	187.60	329.60
		48	22.20	40.50	78.90	194.90	336.50
		54	21.50	41.80	75.30	176.20	314.80
		60	24.20	38.80	80.80	184.40	328.20
T2	2	2	24.60	45.90	81.50	196.20	348.20
		8	20.90	43.10	79.40	186.70	330.10
		14	24.20	43.00	75.80	179.70	322.70
		20	22.20	42.90	79.60	195.00	339.70
		26	22.90	39.50	75.60	182.20	320.20
		35	20.70	44.60	76.60	199.60	341.50
		41	21.50	39.70	82.80	192.10	336.10
		47	22.90	43.70	78.60	198.70	343.90
		53	20.20	43.90	75.70	183.70	323.50
		59	24.20	40.70	80.30	197.30	342.50
T3	3	3	19.00	45.70	82.50	175.70	322.90
		9	21.80	40.30	78.80	180.20	321.10
		15	22.70	43.50	77.50	183.90	327.60
		21	23.80	41.70	80.50	190.20	336.20
		27	22.00	44.70	74.10	188.30	329.10
		34	20.90	42.50	81.10	183.30	327.80
		40	20.90	41.20	74.70	184.90	321.70
		46	19.20	39.30	81.60	189.00	329.10
		52	22.10	42.50	74.40	190.30	329.30
		58	23.40	41.20	80.30	190.60	335.50



**Feed consumption per phases**

**Tab. No. 9e (page 2)**

Treatment	Tr. No.	Box	Feed consumption				
			Starter (D 1-8)	Grower (D 9-16)	Grower (D 17-24)	Finisher (D 24-35)	Total (D 1-35)
			kg	kg	kg	kg	kg
T4	4	4	21.20	43.20	76.20	179.30	319.90
		10	24.10	40.60	79.20	179.90	323.80
		16	23.40	39.25	78.10	179.40	320.15
		22	23.40	38.80	74.70	162.60	299.50
		28	23.60	40.30	75.40	176.00	315.30
		33	20.40	38.30	75.90	174.90	309.50
		39	21.10	44.10	78.80	191.90	335.90
		45	22.60	46.10	79.90	191.40	340.00
		51	21.20	41.40	81.40	185.20	329.20
		57	21.30	43.90	78.40	186.60	330.20
T5	5	5	21.50	43.80	79.90	182.60	327.80
		11	21.60	43.40	77.20	174.60	316.80
		17	23.70	38.10	76.50	183.40	321.70
		23	23.20	39.40	77.30	187.80	327.70
		29	18.70	43.70	77.70	180.30	320.40
		32	23.30	39.00	77.40	180.00	319.70
		38	23.20	43.70	78.30	182.50	327.70
		44	23.40	41.40	75.30	183.20	323.30
		50	21.70	37.50	76.10	185.50	320.80
		56	21.40	44.10	80.70	192.80	339.00
T6	6	6	19.90	45.60	77.10	195.10	337.70
		12	19.90	39.20	79.90	183.20	322.20
		18	17.90	39.10	80.00	182.00	319.00
		24	23.60	42.60	81.90	198.90	347.00
		30	22.10	43.10	78.20	173.50	316.90
		31	23.60	40.00	80.50	187.70	331.80
		37	20.80	37.90	86.00	195.90	340.60
		43	21.20	38.40	77.20	178.80	315.60
		49	21.40	39.40	75.50	171.40	307.70
		55	21.20	44.30	79.30	187.70	332.50

Foot pad lesions

Tab. No. 9f (page 1)

Treatment	Tr. No.	Box	Evaluation	
			right foot	left foot
T1	1	1	1.60	1.62
		7	1.50	1.37
		13	1.23	1.27
		19	1.42	1.53
		25	1.43	1.35
		36	1.08	0.95
		42	1.07	1.00
		48	0.98	0.85
		54	1.38	1.40
		60	1.02	1.00
T2	2	2	1.70	1.68
		8	1.53	1.63
		14	1.43	1.48
		20	1.27	1.38
		26	1.57	1.78
		35	0.87	0.93
		41	1.07	0.95
		47	1.05	0.95
		53	1.33	1.47
		59	1.18	1.13
T3	3	3	1.57	1.52
		9	1.55	1.52
		15	1.55	1.57
		21	1.25	1.42
		27	1.72	1.82
		34	1.00	0.95
		40	1.02	1.05
		46	1.05	0.98
		52	1.20	1.45
		58	1.08	1.05

Foot pad lesions

Tab. No. 9f (page 2)

Treatment	Tr. No.	Box	Evaluation	
			right foot	left foot
T4	4	4	1.28	1.42
		10	1.47	1.40
		16	1.62	1.52
		22	1.15	1.22
		28	1.53	1.50
		33	0.80	0.88
		39	0.97	0.90
		45	0.97	0.95
		51	1.23	1.35
		57	1.12	1.15
T5	5	5	1.25	1.40
		11	1.25	1.33
		17	1.27	1.25
		23	1.25	1.45
		29	1.33	1.33
		32	0.75	0.87
		38	0.87	0.80
		44	0.92	0.95
		50	1.17	1.22
		56	1.15	1.17
T6	6	6	1.45	1.47
		12	1.30	1.38
		18	1.27	1.25
		24	1.77	1.90
		30	1.58	1.47
		31	1.20	1.07
		37	0.92	0.93
		43	1.17	1.12
		49	1.08	1.02
		55	1.03	1.00