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## Impact of Supplementation of Conventional Broiler Feed with Eucarvet on Growth and Slaughter Performance of Broilers

### 1 Introduction

Since January 1, 2006, the use of antibiotic growth promoters is forbidden in the EU. However, several health problems in great broiler herds exist. Therefore, special supplements are needed to improve hygienic and environmental conditions. Eucarvet is the trademark of a feed supplement of the Company TRENKA, Goldeggasse 5, A-1040 Vienna, for pigs, cattle, horses, dogs, cats, and poultry.

In the present trial diets with different levels of Eucarvet (0, 0.33, 0.66 and 1 g/kg) were used and the impact on growth and slaughter performance, and organoleptic meat quality investigated.

### 2 Scientific staff

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### 3 Experimental data's

Place: Poultry trail station, Äußere Wimitz 3, A-9311 Kraig.

Time: July 10 until Aug. 14, 2006

Trial design: Table 1 shows the experimental design. Two hundred and ten ROSS 308 broiler hybrids were randomly divided into 12 pens (3 pens per feeding group). Table 2 shows the nutrient recommendations and table 3 the composition of the diets. Starter, grower and finisher feed of the feeding groups were supplemented with different amounts of Eucarvet as shown in table 1.

**Table 1:** Experimental Design

Trait	Feeding group			
	1	2	3	4
Animals, n	50	50	50	50
Pens, n	3	3	3	3
Eucarvet, g/kg diet	0	0.33	0.66	1.00

**Table 2:** Calculated nutrient content of the diets

Nutrient	Starter	Grower feed	Finisher feed
ME/kg, MJ	12.8	13.0	13.2
Protein, %	21	20	19
L-Lysine, %	1.28	1.22	1.05
DL-Methionine, %	0.56	0.52	0.44
L-Threonine, %	0.84	0.80	0.72
L-Tryptophan, %	0.25	0.24	0.21
Ca, %	0.95	0.90	0.80
P, %	0.70	0.70	0.60
Na, %	0.12	0.12	0.12
Mn, mg/kg	80	80	80
Vitamine A, IU/kg	12000	10000	8000
Cholin-Cl, mg/kg	600	400	200
Monensin-Na, mg/kg	100	100	-

**Table 3:** Components of the diets

Components	Starter	Grower feed	Finisher feed
Maize, %	39.327	41.546	44.132
Wheat, %	20	20	20
Soya-hp, %	27.053	24.656	22.676
Corn gluten meal, %	3	3	3
Grass meal, %	3	3	3
Soya oil, %	3.665	3.998	4.183
Calcium carbonate, %	1.062	0.922	0.990
Dicalcium-P, %	1.709	1.757	1.228
Salt, %	0.261	0.262	0.263
Vitamine premix, %	0.024	0.020	0.016
Trace element premix, %	0.044	0.044	0.044
L-Lysine-HCl, %	0.395	0.401	0.248
DL-Methionine, %	0.241	0.213	0.141
L-Threonine, %	0.091	0.089	0.038
L-Tryptophan, %	0.008	0.011	0.000
Cholin-Cl, %	0.120	0.080	0.040

### 3.2 Growth Performance Traits

Feeding: Diets were offered ad libitum. Starter feed was fed from day 1 until day 14, grower feed from day 15 until day 28 and finisher feed from day 29 until day 35.

Live weight (LW): The live weight of the chicks was recorded on day 1, 14, 28, and 35.

Daily feed intake: Daily feed intake was recorded for the starter, grower and finisher feed.

Feed efficiency: Feed efficiency gives the feed consumption per kg LW-gain and was recorded for the starter, grower, and finisher period.

### 3.3 Slaughter Performance Traits

Live weight with empty stomach (LWes): It presents the live weight of the individual animal after 8 h withdrawal of feed immediately before slaughter.

Eviscerated carcass: Presents the weights of the slaughtered animals without blood, feathers, oil sac, viscera, abdominal fat, and giblets.

Chilled carcass: Presents the weight of eviscerated carcasses after 24 h storage in a cooling chamber at +3 °C.

Frying chicken: Presents the weight of chilled carcasses (without head and neck, and legs at the hock joints).

Giblets: Means the weight of empty gizzard, liver without gall bladder, and heart.

Carcass parts: 12 representative eviscerated carcasses per feeding group were selected as eviscerated carcass and as frying chicks cut into breast, legs, wings, and remainder of carcass.

### 3.4 Organoleptic Test

Pieces (3x3x1 cm) of breast meat from 48 chicken, which were chosen for frying carcass parts, were roasted with a Raclette grill on both sides for 6 minutes at 180°C and then graded by 4 judges for tenderness, juiciness and taste. Subjective scores for the traits ranged from point 1 to 6 as shown in Table 4.

Table 4: Scheme of organoleptic test

Points	Tenderness	Juiciness	Taste
6	very tender	very juicy	very tasty
5	tender	juicy	tasty
4	above average	above average	above average
3	below average	below average	below average
2	tough	Dry	tasteless
1	very tough	very dry	untypical

## 4 Statistical Analyses

Data of growth and slaughter performance were analysed by the use of the ANOVA computer program (SigmaStat<sup>®</sup> 3.1). The data of the organoleptic test were analysed by Friedman test (Essl, 1987).

Model for growth performance traits

$$Y_{ijk} = \mu + FG_i + R_j + e_{ijk}$$

$$Y_{ijk} = \text{Tested parameter}$$

$$\mu = \text{Overall means}$$

$$FG_i = \text{Feeding group } i = 1, 4$$

$R_j$  = Replicates;  $j = 1, 3$

$e_{ijk}$  = Residue

Model for slaughter traits

$Y_{ijk} = \mu + FG_i + G_{ij} + e_{ijk}$

$Y_{ijk}$  = Tested parameter

$\mu$  = Overall means

$FG_i$  = Feeding group,  $i = 1, 4$

$G_{ij}$  = Gender,  $j = 1, 2$  (1 = male, 2 = female)

$e_{ijk}$  = Residue

The Data's of the organoleptic test of breast meat were statistical analysed by FRIEDMAN-Test.

## 5 Trial results

Table 5 shows the contents of nutrients in the diets. The analyses show good values of metabolic energy and a little bit more protein in the diets, but a good conformity between the groups.

Table 5: Results of feed analyses

Nutrient	Feeding group			
	1	2	3	4
	Starter feed			
Dry matter, %	88.5	89.0	89.1	89.0
Protein, %	21.9	22.0	21.9	21.5
Fat, %	6.1	6.2	6.2	6.3
Fiber, %	2.9	3.0	3.0	2.9
Asch, %	5.1	5.2	5.1	5.2
Starch, %	39.3	39.9	39.9	40.1
Suger, %	5.7	5.8	5.3	5.5
Ca, %	0.86	0.90	0.91	0.95
P, %	0.66	0.67	0.67	0.68
Mg, %	0.18	0.18	0.19	0.19
Na, %	0.13	0.15	0.14	0.15
ME/kg, MJ	12.79	12.95	12.87	12.90
	Grower feed			
Dry matter, %	88.6	88.3	88.3	88.7
Protein, %	21.9	21.6	21.4	21.1
Fat, %	3.9	4.1	4.0	4.0
Fiber, %	3.0	2.8	3.0	3.0
Asch, %	5.5	5.5	5.5	5.5
Starch, %	41.6	41.2	41.5	41.6
Sugar, %	5.1	5.0	5.2	5.2
Ca, %	0.93	0.94	0.93	0.96
P, %	0.69	0.71	0.70	0.69
Mg, %	0.19	0.19	0.19	0.19
Na, %	0.14	0.14	0.14	0.14
ME/kg, MJ	12.34	12.28	12.29	12.26

	Finisher feed			
Dry matter, %	88.0	88.3	88.0	88.2
Protein, %	19.2	19.4	19.3	19.0
Fat, %	6.9	7.0	7.6	7.6
Fiber, %	2.6	2.7	2.7	3.0
Rohasche, %	4.4	4.4	4.6	4.6
Starch, %	41.6	41.5	42.2	41.2
Sugar, %	5.0	4.9	4.9	4.9
Ca, %	0.78	0.78	0.76	0.76
P, %	0.56	0.56	0.55	0.56
Mg, %	0.18	0.18	0.17	0.17
Na, %	0.13	0.13	0.13	0.12
ME/kg, MJ	12.94	12.97	13.28	13.07

The daily feed intake between the groups differed only little (Table 6). The average daily feed intake of starter feed was 36 g, of grower feed 116 g and of finisher feed 180 g per animal. The lowest daily feed intake showed feeding group 2 and the highest feeding group 3, but there are no significant differences in daily feed intake between the feeding groups. The average daily feed intake in the whole growth period was for feeding group 1, 2, 3 and 4 93, 90, 96 and 94 g, respectively.

Table 6: Daily feed intake, g/animal/day

Growth period	Feeding group				SEM	P-value
	1	2	3	4		
Pens, n	3	3	3	3	-	-
Day 1 to 14	36	35	37	37	0.8	0.381
Day 15 to 28	114	116	116	117	3.3	0.904
Day 29 to 35	189	176	185	179	9.9	0.802
Day 1 to 35	93	90	96	94	2.2	0.421

Similar to the daily feed intake, the feed efficiency did not differ between the feeding groups (Table 7). The best results showed feeding group 2, but no significant differences appeared between the feeding groups. For the whole growth period the feed efficiency for feeding group 1, 2, 3 and 4 was 1.84, 1.77, 1.83 und 1.82.

Table 7: Feed efficiency, kg/kg LW gain

Growth period	Feeding group				SEM	P-value
	1	2	3	4		
Pens, n	3	3	3	3	-	-
Day 1 to 14	1.45	1.44	1.44	1.42	0.02	0.664
Day 15 to 28	1.76	1.70	1.73	1.75	0.04	0.764
Day 29 to 35	2.29	2.17	2.30	2.26	0.08	0.633
Day 1 to 35	1.84	1.77	1.83	1.82	0.04	0.632

Three chicks died and 26 poorly developed chicks were culled. As poorly developed chicks were chicks eliminated, which did not arrive two thirds of the average live weight of the feeding group.

Table 8 shows the live weight developments. The different feeding groups showed similar results. The average live weight of the chicks at start was 40 g, after 2 and 4 weeks 410 and 1340 g, and at the end of the growth period for feeding group 1, 2, 3 and 4 1872, 1910, 1897 und 1926 g, respectively. All feeding groups with Eucarvet showed higher live weights at the end of the growth period.

Table 8: Live weight

Life time	Feeding group				SEM	P-Wert
	1	2	3	4		
Pens, n	3	3	3	3	-	-
Start, g	40	40	40	40	0.2	0.455
Day 14, g	412	406	409	411	13	0.986
Day 28, g	1319	1361	1349	1348	44	0.915
Day 35, g	1872	1910	1897	1926	26	0.516

Table 9 presents the slaughter performance. The higher live weights of the animals with Eucarvet resulted also in higher carcass weights. No significant differences between the feeding groups exist. The weights of heart, liver, and gizzard showed no significant differences between the feeding groups either.

Table 9: Slaughter performance

Trait	Feeding group				SEM	P-value
	1	2	3	4		
Tiere, n	45	43	49	44	-	-
Live weight empty stomach (LWes), g	1872	1910	1897	1926	26	0.516
Eviscerated carcass, g	1480	1508	1500	1513	21	0.712
Chilled carcass, g	1445	1472	1460	1474	21	0.741
Frying carcass, g	1303	1331	1319	1332	19	0.696
Evis. carcass in % of LWes	79.1	78.9	79.1	78.6	0.2	0.112
Chilled carcass in % of LWes	77.2 <sup>a</sup>	77.0 <sup>ab</sup>	77.0 <sup>ab</sup>	76.5 <sup>b</sup>	0.2	0.040
Frying carcass in % of LWes	69.6	69.6	69.6	69.1	0.2	0.183
Abdominal fat, g	28	29	29	30	1.2	0.778
Heart, g	8.3	8.7	8.5	8.8	0.2	0.252
Lever, g	38	38	38	38	0.8	0.948
Gizzard, g	27	28	28	27	0.5	0.148

In Table 10, the carcass parts of frying chicken of 12 animals per feeding group are listed. The proportion of breast meat in feeding group 2 was highest of all feeding groups and the proportion of wings in feeding group 3 was significantly higher ( $P=0.037$ ) than in feeding group 1.

Table 10: Carcass parts

Trai	Feeding group				SEM	P-value
	1	2	3	4		
Broilers, n	12	12	12	12	-	-
Frying carcass (FC), g	1296	1317	1311	1310	44	0.990
Breast, g	333	354	333	341	14	0.667
Leg, g	382	384	383	389	12	0.979
Wing, g	150	155	171	160	7	0.197

Remainder of carcass, g	430	420	429	418	15	0.917
Breast meat in % of FC	25.6	26.9	25.5	26.1	0.4	0.093
Leg in % of FC	29.5	29.1	29.2	29.7	0.3	0.537
Wing in % of FC	11.6 <sup>b</sup>	11.8 <sup>ab</sup>	13.0 <sup>a</sup>	12.2 <sup>ab</sup>	0.4	0.037
RC in % of FC	33.2	31.9	32.7	31.9	0.4	0.051

## 6 Summary

In present trial with broiler the impact of different doses of Eucarvet (feeding group 1 with no supplementation, feeding group 2 with 0.33 g, feeding group 3 with 0.66 g and feeding group 4 with 1 g Eucarvet/kg compound feed) on growth and slaughter performance was investigated. Growth period lasted 35 days. The average live weight of the animals of feeding group 1, 2, 3 and 4 at the end of the growth period was 1872, 1910, 1897 und 1926 g and the feed efficiency 1.84, 1.77, 1.83 and 1.82, respectively. The carcass traits between feeding groups showed no significantly different values. Eucarvet improved in comparison to feeding group 1 live weight gain by +2.0 %, feed efficiency by -3.9 % and the proportion of breast meat of frying carcass by +5.0 %. The results of this feeding trial indicate 0.33 g Eucarvet/kg diet as an optimal amount of supplementation.