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# COMPARING THE EFFECT OF DIFFERENT METHYL GROUP DONORS ON THE CARCASS QUALITY OF BROILERS IN CHALLENGED CONDITIONS AND THE EFFECT ON THE LITTER QUALITY, FROM 0 TO 38 DAYS OF AGE

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## INTRODUCTION AND OBJECTIVES

Betaine is of particular interest for poultry because of their short life cycle and the growth intensity. Both functions of betaine, as an efficient methyl group donor and as an organic osmolyte, play a key role especially when animals are under challenged conditions including dietary changes, heat stress, temperature stress (fluctuation between the day and night temperatures) and pathogenic challenges (mainly coccidiosis) often with wet litter as a consequence. In such conditions, the demand on methyl groups is considerably increased, the mineral and water balance might be disturbed and the cell wall integrity potentially damaged.

for increased animal performance and improved carcass quality. Whilst in challenged conditions, it may alleviate consequences by leading to fewer digestive disorders and lower mortality, thereby better production efficiency.

A recent study in Thailand conducted in cooperation with Mr. Saksit Srinongkote (Animal Research Consultant) underlines the aforementioned aspects. It shows the effects of different methyl group donors on the carcass quality of broilers in challenged conditions, and the effect on the litter quality.



Litter score data showed positive effect of natural betaine on managing gut health in challenged conditions.

Energy is one of the major dietary cost factors in poultry production and osmoregulatory responses are highly energy consuming processes. Betaine, being involved in the energy metabolism, can reduce the energy required for the osmoregulation. Under normal conditions, the saved energy can be used

## MATERIALS AND METHODS

Four hundred newly hatched male broiler chickens of commercial strain Ross 308, were randomly allocated to 5 treatments with 8 replications using 10 male birds in a pen as an experimental unit. A practical corn-soybean meal diet was formulated as the positive control (PC) diet, for each growing phase. A negative control (NC) diet, with 100 kcal ME/kg lower than that of the PC diet, was formulated for each growing phase. The test methyl group donor products were supplemented in the NC diet, at the same level of activity: 1000 mg/kg of complete feed, as shown in the treatment design below:

- Diet 1:** Positive control (PC) practical corn-SBM diet, according to Ross 308 nutritional guideline
- Diet 2:** Negative control (NC) as diet 1, but with lower ME by 100 kcal/kg
- Diet 3:** NC + Test betaine product 1 BET1 – ActiBeet® L 40% (liquid, natural source of betaine)
- Diet 4:** NC + Test betaine product 2 BET2 – crystallized natural betaine product 96%
- Diet 5:** NC + Test product 3 CHOL3 – choline chloride 50%, synthetic product

After body weight measurement on day 38, two birds from each pen were selected and slaughtered for carcass measurements (breast meat yield, thigh yield, drumstick and abdominal fat). On day 38, the litter in each pen was assessed by visual scoring. Additionally, a litter sample of about 1 kg was collected from each pen for litter moisture content evaluation (80° C for 24 hours). The data was subjected to analysis of variance as a randomized complete block design.

## ENCOURAGING FINDINGS IN CHALLENGING CONDITIONS

- Improvement in breast meat yield and lower abdominal fat content were observed by supplementing natural betaine products (table 1).
- All methyl donor products could improve litter quality by reducing the score of visual litter assessment and litter's moisture content; better results were achieved with AGRANA's natural source of betaine ActiBeet® L.

## RESULTS

Results on the effect of different methyl donor products on carcass traits of broilers (38 day of age)

Treatment group	Breast meat (%)	Thigh (%)	Drumstick (%)	Abdominal fat (%)
T1 : PC diet	27.12	16.47	13.25	2.49
T2 : NC diet (-100 kcal ME/kg)	26.43	16.90	13.83	2.45
T3 : NC + BET1	27.74	16.15	13.38	2.44
T4 : NC + BET2	27.12	16.44	13.49	2.46
T5 : NC + CHOL3	27.09	17.00	13.29	2.58
<i>P-value</i>	0.5359	0.2536	0.1236	0.9948
<i>Pooled SEM</i>	0.520	0.295	0.163	0.046
<i>C.V.%</i>	5.42	5.03	3.42	7.04

Results on the effect of different methyl donor products on the litter quality of broilers (38 days of age)

Treatment group	Litter Score <sup>1</sup> (score)	Litter DM (%)	Litter Moisture (%)
T1 : PC diet	1.75	74.70	25.30
T2 : NC diet (-100 kcal ME/kg)	1.69	74.93	25.07
T3 : NC + BET1	1.44	78.36	21.64
T4 : NC + BET2	1.38	78.07	21.93
T5 : NC + CHOL3	1.56	76.84	23.16
<i>P-value</i>	0.5339	0.5115	0.5175
<i>Pooled SEM</i>	0.178	1.874	1.871
<i>C.V.%</i>	32.20	6.92	22.57

<sup>1</sup>Litter samples collected from the middle of the pen using a 20 cm diameter sampling ring. Visual scoring on the scale of 1–3, where 1 = Good (light brown color and quite dry), 2 = Fair (brown color and quite wet) and 3 = Poor (dark brown color and wet)