Role of carvacrol and cynnamaldehyde in broiler cecal fermentations

Grilli E., Albonetti S., Piva A.

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Aim of the study was to investigate the role of carvacrol and cynnamaldehyde in modulating cecal microflora in broilers in an in vitro fermentation system. Cecal liquor was collected at the slaughter house, transported to the laboratory and immediately anaerobically diluted with a buffered solution; the so-obtained inoculum was dispensed in 10 ml syringes and 50 ml vessels (5 for each treatment) containing a pre-digested diet, carvacrol and cinnamaldehyde at the final concentration of 0, 75, 150, 300, 600, 900 e 1200 ppm. Syringes and vessels were sealed and incubated at 39°C for 24h. Gas production was monitored from syringes throughout the study and after 24 hours ammonia concentration was measured from each vessel. A modified Gompertz bacterial growth model was used to fit gas production data as indicator of microbial growth. Curve fitting, total gas production, maximum rate of gas production, duration of the exponential phase and ammonia data were analyzed by ANOVA. Each syringe and vessel formed teh experimental unit; the differences among means of groups were analyzed using teh Student-Dunnet test. Differences with the control were considered statistically significant at $P<0.05$. Data showed that, compared to control, carvacrol significantly depressed total gas production and exponential phase duration at 600, 900 and 1200 ppm (-53%, -64%, - 76% and -62%, -73%, -72% respectively, $P<0.01$), while it increased the maximum rate of gas production at 600 and 900 ppm (+29%, + 52%, $P<0.05$). Proteolysis, as indicated by ammonia concentration, was significantly reduced only by 1200 ppm of carvacrol (-26%, $P<0.05$). Cinnamaldehyde did not modify and intestinal microbial parameter. These results suggest that carvacrol can modulate the microbial fermentation when used at or above 600 g/ton of bioavailable carvacrol at cecal level. Cinnamaldehyde was not effective in modulating the broiler cecal flora..

HEADQUARTERS:
Vetagro S.p.A.
Via Porro 2 42124 Reggio Emilia - Italy
info@vetagro.com
infowesteu@vetagro.com
Tel: +39 0522 186 1500
Fax: +39 0522 92 7025
www.vetagro.com

OTHER LOCATIONS:
Vetagro Eastern Europe Kft.
Váci utca 81 1056 Budapest - Hungary
infoeasteu@vetagro.com
Tel: +39 0522 186 1500
Fax: +39 0522 92 7025

Vetagro Yem Ticaret A.Ş.
Levent Mahallesi, Cömert Sokak, No: 1
Yapı Kredi Plaza C blok Kat:17 No:40-41
Ofis:16 34330 Beşiktaş - Istanbul
info@vetagro.com
Tel: +90 212 318 9059
Fax: +90 212 317 4701

Vetagro Inc.
230 South Clark Street, # 320,
Chicago, IL 60604 - USA
infousa@vetagro.com
Tel: +1 773 610 2087
Fax: +1 773 442 0131