for laboratory analysis in the first and last days of the experiment, for counting oocysts per gram of feces (OOPG). Data were analyzed using the MIXED procedure of SAS and Tukey as post hoc tests for separation of means. Friedman nonparametric test was done for repeated analysis of means. Friedman nonparametric test was done for repeated analysis of means and Tukey as post hoc tests for separation of means.

Results of this experiment suggest that toltrazuril 5% in the dose of 15 mg/kg can reduce parasite infestation in the gastrointestinal tract. Infestation in the beginning of the experiment was not deleterious enough to cause changes in average daily gain.

Table 1 (Abstr. 42). Effects of dosing 15 mg/kg of toltrazuril 5% to cattle with S. agalactiae (ATCC 13813), K. pneumoniae (ATCC 13048), and P. mirabilis (ATCC 14153) and Proteus vulgaris (ATCC 9484). Extracts from both plants showed antibacterial activity against all bacteria tested, with the exception of P. mirabilis.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group</th>
<th>Control</th>
<th>Treatment</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADG, g/d1</td>
<td>596±4</td>
<td>656±3</td>
<td>247±6</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Oocysts per gram of feces, d 1</td>
<td>982.76±A</td>
<td>988.89±A</td>
<td>108.94</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td></td>
<td>786.21±A</td>
<td>730.56±A</td>
<td>113.34</td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>

a,b Values with lowercase letters indicate differences between treatments; those with uppercase letters indicate difference between d 1 and 60 (Friedman nonparametric test).

1Tukey post hoc test.

Key Words: toltrazuril, coccidiosis, oocysts per gram of feces

M43 In vitro evaluation of the antimicrobial activity of plant extracts from Ruta graveolens and Annona muricata, Yadielea Portilla1, María Dolores Carro2, Grethel Milián1, Conrado Camacho1, Aymara Valdivia1, Alexey Díaz2, Cristina Saro1, Iván Mateos3, and María José Ranilla*

Resistance of microorganisms to commercial drugs is increasing worldwide, and therefore the search for new antimicrobial agents is a key issue. The aim of this study was to identify the potential of plant extracts from Ruta graveolens and Annona muricata as candidates for the development of new antimicrobials. Plant extracts were obtained by the Soxhlet method and their biological evaluation was carried out by the agar diffusion method, with 4 doses assayed (6.25, 25, 50 and 100 mg/mL) and 4 replications per dose. Eight bacterial strains from American Type Culture Collection (ATCC) were tested: Escherichia coli O157 (ATCC 43894), Streptococcus agalactiae (ATCC 13813), Salmonella enteritidis (ATCC BBA664), Enterobacter aerogenes (ATCC 13048), Staphylococcus aureus (ATCC 13565), Klebsiella pneumoniae (ATCC 4352), Proteus mirabilis (ATCC 14153) and Proteus vulgaris (ATCC 9484). Extracts from both plants showed antibacterial activity against all bacteria tested, with the exception of A. muricata extract against S. enteritidis. Minimum inhibitory concentration for both extracts was 6.25 mg/mL for E. aerogenes, S. agalactiae, S. aureus, and K. pneumoniae, 25 mg/mL for E. coli, P. mirabilis, and P. vulgaris, and 50 mg/mL of R. graveolens for Salmonella enteritidis. There were no differences between extracts in their antibacterial activity against P. vulgaris (P = 0.91) and K. pneumoniae (P = 0.37), but R. graveolens extract showed greater (P < 0.001) antibacterial activity against E. coli and S. agalactiae than A. muricata extract, and a trend was also observed for E. aerogenes (P = 0.064). In contrast, A. muricata extract tended to have greater (P = 0.094) antibacterial activity against P. mirabilis compared with R. graveolens extract. The results suggest that these extracts have active ingredients that could help to develop new antimicrobial products for the improvement of animal production and health.

Key Words: Ruta graveolens, Annona muricata, gram-positive

M44 OmniGen-AF affects expression of immune-related genes in whole blood of healthy Angus heifers. S. A. Armstrong1,2, D. J. McLean1, T. H. Schell1,2, G. Bobe2, and M. Bionaz2,1 Pihbio Animal Health, Corvallis, OR, 2Department of Animal and Rangeland Sciences, Oregon State University, Corvallis, OR.

Purebred Angus heifers were used to determine the effect of OmniGen-AF (OG) supplementation on expression of cytokines, chemokines, and associated receptors involved in the inflammatory response in whole blood cells of healthy Angus heifers within the first 28 d of supplementation. Heifers were randomly assigned to control or supplemented daily with 56 g OG group (n = 4/group), and fed a diet including grass hay, alfalfa and ground corn. Heifers were housed in a freestall barn and fed via Calan Broadbent system. Blood was collected via jugular before the study started (0) and on d 3, 5, 10, 14, 21, and 28 of supplementation. The qRT-PCR was performed using the Cov Inflammatory Cytokines and Receptor qPCR array (Qiagen). Data were analyzed using LinReg software to account for efficiency of amplification and normalized by 3 internal control genes (HPRT1, TBP, and YWHAZ). qRT-PCR data were log-transformed and the samples with Studentized residuals t > 2 removed. The final data set (82 genes) was subjected to ANOVA analysis with treatment, time, and treatment x time as main effect and animal as random using JMP Genomics of SAS. Significance was deemed with a false discovery rate-adjusted P-values < 0.10. Genes coding for chemokine receptors (CX3CR1, CXCR1), stress response (NAMP), osteoclastogenesis (TNFRSF11B), and angiogenesis (VEGFA) were affected by treatment x time. Thirteen genes coding for interleukins and interleukin receptors (IL1B, IL9, IL1RN, IL1RI, IL10RB, IL10RA), chemokine ligand and receptors (CCR2, CCL2, CCRX1, CCL26, CCR1), macrophage function (CSF1), and secondary immune response (BMP2) were downregulated and CCLI was upregulated by OG supplementation. Of the 23 receptors evaluated, 9 (39%) were influenced by OmniGen-AF supplementation. Overall, the data suggest a transcriptional inhibition of genes related to inflammatory response by OG during the first 28 d of supplementation of healthy Angus heifers.

Key Words: OmniGen-AF, immune, cytokine

M45 Influence of hydrolysable tannin extract on nematode egg count in feces of receiving beef cattle. Melissa B. Corona1, Eva X. Murillo1, Billy J. Cervantes2, Nohemi Castro1, Javier A. Romo1, Soila M. Gaxiola1, and Rubén Barajas*1,2 FMIYZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, 2Ganadera Los Migueles, S.A. de C.V., Culiacán, Sinaloa, México.

The nematode parasites decline productivity of beef cattle. The nematode egg count is decreased in feces of cattle grazing plants with high hydrolysable tannin content. There is little information of effect of added tannins to the diet on nematodes present in beef cattle. In this experiment 40 receiving bull-calves were involved to determine the influence of hydrolysable tannin extract on nematode egg count in feces of receiving beef cattle. Bull-calves were placed in 8 dirt-floor pens, and during 3 continuous days, fecal samples were taken from each. They were randomly assigned to treatments: (1) 70% roughage (16.1% CP; 1.27 Mcal NEm/kg DM) corn silage-based diet (Control); (2) Control