328 The Potential Role of Two Red Seaweeds That Promote Anti-methanogenic Activity and Rumen Fermentation Profiles Under Laboratory Conditions. Byeng Ryel Min[1], Giusi Genovese[2], Lana Castleberry[1], Cathy Lockard[1], Heidi Waldrip[1], Daniel Miller[1], Alexia Akbay[3], Marina Morabito[2], Antonio Manghisi[2], Damiano Spagnuolo[2], David Brauer[1], *[1]USDA-ARS, [2]University of Messina, Italy, [3]Symbrosia*

Ruminal methane (CH_4) production results from carbohydrate fermentation by ruminal microbiota (methanogens) to produce CH_4, volatile fatty acids (VFA), carbon dioxide (CO_2), nitrous oxide (N_2O), and hydrogen (H_2) in a reduction pathway. The aims of this study were to assess the effects of two red seaweed (RSW) species (Asparagopsis taxiformis and A. armata; collected from Messina, Italy). The two RSW were identified by DNA barcoding and genetic data were deposited in BOLD Systems (REAPP006-21, REAPP004-21, respectively). The two RSW were used at dietary inclusion levels (0, 2, and 4% as-fed basis) in an anaerobic in vitro study (39°C for 48-h) to examine greenhouse gas (GHG) production and VFA profiles. Gases were collected using an ANKOM Gas Production system and analyzed for CH_4 and N_2O by gas chromatography. Asparagopsis taxiformis contained higher levels of bromoform (201 vs. 7.0 mg/kg DM), iodine (4820 vs. 3260 ppm), and crude protein (16 vs. 15.6% DM), than A. armata, which contained higher levels of acid detergent fiber (ADF; 7.7 vs. 19.0%) and neutral detergent fiber (NDF; 13.2 vs. 19.2%), respectively. RSW supplementation increased total gas, butyrate and valerate production ($P < 0.01$), while production of CH_4 (mg/g DM), acetate (A), propionate (P), A/P ratios and in vitro dry matter digestibility (IVDMD; % DM) were reduced ($P < 0.01$) as RSW supplementation increased. In the presence of A. taxiformis, production of N_2O (µg/g DM), tended to be less ($P = 0.1$) at 2% DM, but increased ($P < 0.01$) N_2O production with A. armata at the 2 and 4% DM. Therefore, it may be possible to suppress methanogenesis both directly and indirectly by addition of RSW. To efficiently use seaweeds as feed ingredients with nutritional and environmental benefits, more research is required to determine the mechanisms underlying seaweed and dietary substrate interactions.

Key words: red seaweed, bromoform, methane mitigation

336 Occurrence of Mycotoxins in 2020 US Pasture Grasses and Harvested Hay Feed Ingredients. Erin Schwandt[1], Paige N. Gott[1], Shelby M. Ramirez[1], Ursula Hofstetter[1], Raj Murugesan[1], *[1]Biomin America Inc.*

Mycotoxins are harmful secondary fungal metabolites which limit animal health and performance through various negative effects such as reduced feed intake, diarrhea, and compromised immune and reproductive function. These metabolites are found in a variety of feedstuffs worldwide. This study monitored mycotoxin occurrence and contamination levels in fresh pasture grasses and harvested dry hay from across the US. Samples were screened for six major mycotoxin groups: aflatoxins, type A trichothecenes (A-Trich), type B trichothecenes (B-Trich), fumonisins (FUM), zearalenone (ZEN), and ochratoxin A via LC-MS/MS. Samples that were above the limit of detection for each mycotoxin group were analyzed using the GLIMMIX procedure of SAS (SAS 9.4, Cary, NC) to test the effect of harvest year on average contamination level. Results are presented in Table 1. Zearalenone and B-Trich contamination prevalence for fresh grass samples was lower in 2020 compared to the previous two years. A-Trich tested positive in 34% of samples which was greater in 2020 compared to 2018 and 2019. Mean concentration levels (parts per billion, ppb) for B-Trich, ZEN, A-Trich were not different in 2020 compared to the previous two years. Prevalence of mycotoxin contamination for dry harvested hay samples for B-Trich and ZEN decreased in 2020 compared to the previous two years, but 64 and 28% of samples tested positive, respectively. A-Trich prevalence was greater than the last two years and resulted in 17% of samples testing positive compared to 0 and 6% in 2018 and 2019, respectively. Mean B-Trich levels in 2020 were similar to levels seen in 2018 and lower than 2019 ($P = 0.005$). Mean ZEN and A-Trich concentration levels averaged 1,612 ppb and 796 ppb, respectively. Mycotoxin analysis of pasture grasses and harvested hay forages is warranted to identify potential sources of mycotoxin contamination in ruminant diets.