PSVIII-B-14 Peroxisome Proliferator-Activated Receptor Gamma Activation Protects Against Deoxynivalenol-Induced Intestinal Barrier Dysfunction in Jejunal Ipec-J2 Cells. Enkai Li1, Nathan Horn2, Kolapo Ajuwon1, 1Purdue University, 2United Animal Health

Abstract: The role of peroxisome proliferator activated receptor gamma (PPARg) in the regulation of lipid metabolism, adipocyte differentiation and inflammatory response has been well characterized. Besides adipose tissue, PPARg is also highly expressed in the intestine. However, the functional role of PPARg in the regulation of intestinal function still remains poorly understood. In the present study we sought to understand the role of PPARg activation on intestinal barrier function in IPEC-J2 cells exposed (2 mM, 24 hr) to the mycotoxin, deoxynivalenol (DON). PPARg activation by rosiglitazone and troglitazone dose-dependently increased (P < 0.05) the protein expression of tight junction proteins (TJP), claudin-3 and 4. On the contrary, the protein abundance of claudin-3 and 4 was dose-dependently decreased by PPARg antagonist, T0070907. DON exposure decreased the protein expression of TJP, and also significantly suppressed (P < 0.05) PPARg transcriptional activity. Consistent with the therapeutic benefits of PPARg agonists, pretreatment of cells with PPARg agonists (40 mM) reversed (P < 0.05) the reduction of claudin-3 and 4 induced by DON exposure. Immunofluorescence analysis showed that the decreased membrane presence of claudin-4 and ZO-1 induced by DON was also reversed by troglitazone. Effect of PPARg activation also included partial restoration of transepithelial electrical resistance (TEER) and reduction of FITC-dextran permeability that have been disrupted by DON. However, the protective effects of PPARg agonist against DON exposure was abolished by PPARg antagonist, confirming the importance of PPARg in the observed effects of the agonists. This shows the importance of PPARg activity in the maintenance of intestinal epithelial cells homeostasis and barrier function, especially during periods of metabolic stress induced by the mycotoxin, DON. Therefore, pharmacological and natural bioactive compounds with PPARg agonist activity could be effective in preventing DON-induced gut barrier dysfunction in vivo.

Keywords: PPARg, deoxynivalenol, endocytosis, tight junction

PSVIII-B-11 Grain Processing Methods and Fiber Sources in the Brazilian Beef Feedlots. Thiago Bernardes1, Thais Castro1, Matheus Da Luz1, 1University of Lavras

Abstract: The aim of this survey was to identify grain processing techniques and fiber sources adopted in the beef finishing diets. One hundred and forty-nine feedyards, located in 10 states, were surveyed from March 2020 to February 2021 for their feeding practices. Feedlot owners and nutritionists were interviewed by using a common survey form. The form consisted of 5 questions, including feedlot location, feedlot capacity and the number of animals serviced yearly, breed, grain processing techniques and roughage sources, and roughage: concentrate ratio. Results were tabulated in an Excel spreadsheet for each feedlot. The number of responses per question, and the mean, minimum value, maximum value, and mode (most frequently occurring value) were calculated. Feedlot capacity ranged from 300 to 40,000 (mode = 3,000) and cattle serviced yearly per feedlot ranged from 400 to 90,000 (mode = 6,000). Nellore breed and crossbreed represented 67 and 33% of finished animals, respectively. Roughage: concentrate ratio ranged from 40: 60 to 10: 90. Thirty-four percent of feedlots adopted 20: 80 ratio, followed by 25: 75 (17.5%) and 15: 85 (14%) ratios. High-moisture corn, snaplage (grain, cob, husk, and shank), and reconstituted grain corn were used by 21, 12, and 6.7% of feedlots, respectively. Reconstituted grain sorghum was included in 4% of the diets. Whole-plant corn silage was the most common roughage source (59.5%), followed by sugarcane bagasse (16%), tropical grass silages (14%), and whole-plant sorghum silage (13%). Nutritionists also cited hay (8%), sugarcane silage (6%), and fresh sugarcane (3%) as roughage sources. Overall, Brazilian feedlots have used ensiling as the most important method to process grains (corn and sorghum), especially because silage machinery industry has made available new equipment. Whole-plant corn silage is the most common fiber source.

Keywords: beef finishing diet, grain processing, silage utilization