CALIFORNIA AIR RESOURCES BOARD

Research Screening Committee Meeting
Cal/EPA Headquarters Building
1001 I Street
Conference Room 510, 5th Floor
Sacramento, California 95814
(916) 445-0753

July 13, 2018
9:00 a.m.

ADVANCE AGENDA

I. Approval of Minutes of Previous Meeting

February 2, 2018

II. Discussion of Requests for Proposals (RFP):

1. "PM Health Impacts: Work Loss Days, Asthma, and Other Health Measures," $400,000, RFP No. 18RD005

2. "Off-Road Diesel Low-Emission Demo for NO_X, Particulate Matter and Toxics," $500,000, RFP No. 18RD006

3. "Determinants of Medium- and Heavy-Duty Truck Fleet Turnover," $500,000, RFP No. 18RD007

III. Discussion of Draft Final Reports:

1. Characterize California-specific Cattle Feed Rations and Improve Modeling of Enteric Fermentation for California's Greenhouse Gas Inventory," University of California, Davis, $99,964, Contract No. 16RD001

Enteric fermentation is the single largest source of methane (CH_4) emissions in California. It contributes about 30 percent of the total methane emissions in the state, most of which are from cattle. This estimate was, however, based on the U.S. Environmental Protection Agency (U.S. EPA)'s Cattle Enteric Fermentation Model (CEFM) using default national or regional assumptions and model parameter values regarding feed Gross Energy Intake (GEI) and methane conversion factors (Ym). Enteric methane emissions can vary not only with different types of animals, but also with feed intake and nutrient

composition. Those variables can change over time and across regions depending on feed availability and local economics. This study updated the feed intake and diet composition for California cattle, analyzed recent California-relevant literature data between diet characteristics and enteric methane emissions, and developed a set of new California-specific empirical models that can provide more accurate enteric methane emissions estimates from California cattle. Through regression analyses, the study identified the following most important predictor variables for enteric methane emissions: dry matter intake (DMI), neutral detergent fiber (NDF) or digestible NDF (dNDF), ether extract (EE), and GEI, depending on the type of cattle considered. The study also updated Y_m values from 0.048 to (0.055 or 0.069) for dairy cow groups. The new models estimated 10 percent higher CH_4 emissions due to the higher Y_m values compared to the U.S. EPA model, but an overall 5 percent lower CH_4 emission estimate if both the updated Y_m values and feed intake matrix were used. The new models have resulted in more accurate dietary changes in California cattle operations, improved methane emission estimates from California cattle, and can be used to inform the California's Short-Lived Climate Pollutant Reduction Strategies.