Annual Report 2020 -- Multi-State Project S-1074:

Future Challenges in Animal Production Systems: Seeking Solutions through Focused Facilitation

Specific objectives of this project are to:

* Create issue-focused adaptive networks that transcend discipline and stakeholder boundaries now and into the future;
* Synthesize data, analytical tools and communication mechanisms to evaluate and discuss animal protein supply chain sustainability metrics on various spatial and temporal scales;
* Propose solutions, research and Extension directions to significantly contribute to sustainable animal protein systems and food security with forecasting of future trends*.*

## Participating States and Respective Principal Investigators (PIs)

**Table 1. Participating states and respective principal investigators**

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| **Name** | **State** | **Institute** |
| Luis F Rodriguez | Illinois | University of Illinois |
| Erin L Cortus | Minnesota | University of Minnesota |
| Kevin A. Janni | Minnesota | University of Minnesota |
| Shafiqur Rahman | North Dakota | North Dakota State University |
| Rebecca Larson | Wisconsin | University of Wisconsin |
| Deanne Meyer | California | University of California, Davis |
| Lide Chen | Idaho | University of Idaho |
| Jacek Koziel | Iowa | Iowa State University |
| Zong Liu | Texas | Texas A&M University |
| Jun Zhu | Arkansas | University of Arkansas |
| John Classen | North Carolina | North Carolina State University |
| Teng T Lim | Missouri | University of Missouri |
| Lingying Zhao | Ohio | Ohio State University |
| Jactone Ogejo | Virginia | Virginia Polytechnic Institute and State University |
| Kevin Wagner | Oklahoma | Oklahoma State University |
| Ken Casey | Texas | Texas A&M University |
| Xufei Yang | South Dakota | South Dakota State University |
| Lilong Chai | Georgia | University of Georgia |
| Mahmoud Sharara | North Carolina | North Carolina State University |

**Table 2. Participants**

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| **Name** | **State** | **Institute** |
| Albert Heber | Indiana | Purdue University |
| Alison Deviney | North Carolina | North Carolina State University |
| Amirhossein Mahdavirab | Texas | Texas A&M University |
| Anna Marshall | Illinois | University of Illinois at Urbana-Champaign |
| Baitong Chen | Iowa | Iowa State University |
| Danadhi Gunawardana | Texas | Texas A&M University |
| Denise Mullinax | California | California Dairy Research Foundation |
| Geoffrey Vanden Heuvel | California |  |
| Hamed El Mashad | Missouri | Lincoln University |
| Harrison Reilly | California | Cogent Consulting |
| J.P.Cativiela | California | Cogent Consulting |
| Jacqueline Welles | North Carolina | North Carolina State University |
| Jiqin Ni | Indiana | Purdue University |
| Kevin Abernathy | California | California Milk Producers Council |
| Lu Sun |  |  |
| Michael Boccadoro | California | Dairy Cares |
| Noelle Soriano | Minnesota | University of Minnesota |
| Paul Sousa | California | Western United Dairies |
| Regina C McGoff | Minnesota |  |
| Rick Koelsch | Nebraska | University of Nebraska Lincoln |
| Till Angermann | California | California Dairy Research Foundation |
| Wendy Powers | California | University of California |
| Zifei Liu | Kansas | Kansas State University |

## Summary of 2020 S1074 Annual Meeting Minutes

* The 2020 S1074 Annual Meeting was held online through zoom on 20th and 21st of May 2020. This meeting consisted of four main sessions, Water quality issues briefing and Air quality issues briefing by California Dairy Industry Panel, annual meeting and discussion on next focus issues, and discussion on nutrient imbalance manuscript.
* First session was Water quality issues briefing by California dairy industry panel, which was held at 9.00 am pacific time on 20th May 2020 and chaired by Deanne Meyer. This session consisted of four individual presentations.
* An update on Sustainable Groundwater Management Act was given by Geoffrey Vanden Heuvel, where he reported the critically over drafted regions and actions to be taken in case of a restricted water supply.
* An update on Central Valley Dairy Representative Monitoring Program was given by Till Angermann. He highlighted that the N concentrations in ground water largely exceed the water quality objective of 10 mg/L and show an increasing trend, and discussed potential solutions to prevent N buildup.
* Third presentation of this session was done by J.P. Catviella on salt and nitrate control plan. He introduced the program where dischargers who cannot meet water quality objectives are allowed to contribute through an alternative pathway where they can collaborate on increasing drinking water quality and availability. The management approach, critical regions, main challenges and economic considerations were discussed.
* During the final presentation Denise Mullinax introduced California Diary Quality Assurance Program (CDQAP), a collaboration of many organization which focuses on providing education on regulatory compliance and regulatory changes. She discussed the three-part process in obtaining CDQAP certification, ongoing research projects and current market situation of dairy manure.
* The second session was Air quality issues briefing by California dairy industry panel, which was held at 11.30 am pacific time on 20th May 2020. This session consisted of three presentations.
* The first presentation, by Michael Boccadoro, was on California’s approach and progress regarding dairy methane reduction. He mentioned that dairy manure was the main source of methane in California, and discussed the current strategies and policies on methane reduction. He reported that using digesters and alternative manure management programs (AMMPs), a 25% methane reduction has been achieved since 2013.
* The second presentation, by Kevin Abernathy was on managing gaseous emissions by California dairy industry. He reported that 30% of VOC emissions have been reduced through general practices such as covering piles, and suggested to focus on ozone levels, nitric oxides and converting renewable natural gas to electricity in the future
* Paul Sousa demonstrated the use of incentives as a way to improve effectiveness in air quality management and motivate dairy farmers to maintain standards
* Third session was the annual meeting and next focus discussion, which was held at 11:00 am on 21st May 2020
* Initially there was an informal discussion, where participants shared their experiences, work and research experience
* Discussion on focus issues was moderated by Kevin A. Janni. Suggested focus issues were next generation livestock housing, nutrient imbalance, livestock and local community, air quality, nutrient separation and recovery, and processed manure markets.
* It was decided to keep nutrient imbalance as the primary focus issue, and have nutrient separation/ recovery and processed manure markets as secondary focus issues
* John Classen suggested to include graduate students in the collaboration and Kevin Janni suggested to do multi- state collaborations to do large scale projects
* Shafi Rahman was elected as the secretary for the upcoming year
* Former secretory Zong Liu requested to send reports for each state within 30 days
* It was suggested to have four 1 hour 30 min S-1074 webinars on third Friday of September, November, February, and April.
* During the final session manuscript on nutrient imbalance was discussed
* John Classen suggested mapping the available technologies and identifying steps to address nutrient imbalance
* Mohmaud Shahara suggested adding a section on identifying the regions where the nutrient imbalance is most severe
* Jack Koziel suggested to include more figures to make the information more comprehensible
* A question about uncertainties was asked by Deanne Mayer, who suggested using a precision improvement technique to account for uncertainty
* Jack Koziel suggested to include something about upcoming work
* It was decided to get the participants opinions on how to proceed with the manuscript