Western odor and air quality education program offered in Idaho

The Situation
Idaho ranks fourth in milk production and 14th in beef production in the Nation (1). Concentrated Animal Feeding Operations (CAFO) have become the norm in animal food production (milk, beef, poultry and pork) to be economically viable in today’s agricultural world. With concentration of large numbers of animals on relatively small surface areas, new environmental impacts and challenges arise. Gas and odor emissions are among those challenges. Federal, state, and county regulations address those emissions to reduce and/or mitigate their effect on the environment and rural and urban communities. Rules are evolving constantly as well as new scientific discoveries that are shedding light on how gas and odor emissions occur, how they interact with the environment, and how producers can reduce or mitigate those emissions by using diverse Best Management Practices (BMP) based on scientific data. University Extension and Research professionals from the Western United States identified the need to present available information regarding the latest (as well as traditional) discoveries and BMP’s on CAFO air quality and odor management to producers, federal, state and county agencies, lawmakers, advocate groups, agricultural and extension professionals, and regulatory agencies.

Our Response
University of Idaho Extension teamed with Washington State University, University of California Davis, New Mexico State University, and Oregon State University to present and obtain a grant from the USDA Western Region Sustainable Agriculture Research and Education (WSARE). The educational program developed through this grant aimed to educate clientele on air quality issues in their region and the

BMP’s available to livestock producers to mitigate the impact of their operations. Since the program included a diverse audience and touched on some contentious issues, we brought the best up-to-date science-based information in a relaxed but serious academic environment that promoted interaction among participants.

Presenters were among the top scientists and extension educators in their area of expertise in the USA. Besides the professionals from the universities who obtained the grant, other presenters included professionals from Texas A&M University, Purdue University, Louisiana State University, as well as USEPA Boise Office, Idaho State Department of Agriculture (ISDA), and Idaho Department of Environmental Quality (IDEQ).

The program included presentations on air quality measurement techniques of most common CAFO air borne issues such as ammonia, hydrogen sulfide,
odor, and others. For each pollutant, measurement techniques were discussed, followed by a presentation on BMP’s showing the audience how each pollutant is produced, measured, and reduced/controlled. Presentations also included federal and state regulations regarding air quality, CAFO permits, and a discussion of potential new rules. Air quality monitoring equipment was available on-site to be observed by participants. Finally, participants toured a dairy and compost facility to observe on-site BMP’s discussed during the program. This WSARE funded program has been presented in the states of New Mexico, Idaho, and Washington. The United Dairymen of Idaho, Jerome and Gooding County Commissioners, Si-Ellen Dairy, Magic Valley Compost, and Farm Bureau Insurance collaborated and supported this educational program in Idaho.

**Program Outcomes**

Forty-six (46) participants attended the program. Dairy producers, County Commissioners, P&Z officials, NRCS, IDEQ, ISDA personnel, nutrient management planners, agricultural goods/services companies, and educators were among the attendees.

To assess impact, we distributed a one-page questionnaire to each attendee at the beginning and at the end of the program. We asked them to rate their knowledge on topics presented before and after attending the program (Table 1). The measurement scale had five points from *Very High Knowledge* = 5 (maximum) to *Poor knowledge* = 1 (minimum). Table 1 shows that participants significantly increased their knowledge in all topics presented.

Table 1. Impact on knowledge gain on each topic presented.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Pre-program knowledge rating</th>
<th>Post-program knowledge rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal and regional air regulations</td>
<td>1.93</td>
<td>3.20 *</td>
</tr>
<tr>
<td>Measuring livestock odors</td>
<td>2.13</td>
<td>3.20 *</td>
</tr>
<tr>
<td>Odor mitigation BMP</td>
<td>1.93</td>
<td>3.40 *</td>
</tr>
<tr>
<td>Ammonia measurement techniques</td>
<td>1.80</td>
<td>3.33 *</td>
</tr>
<tr>
<td>Ammonia mitigation BMP</td>
<td>1.86</td>
<td>3.60 *</td>
</tr>
<tr>
<td>VOCs measurement techniques</td>
<td>1.66</td>
<td>3.07 *</td>
</tr>
<tr>
<td>VOCs mitigation BMP</td>
<td>1.60</td>
<td>3.28 *</td>
</tr>
<tr>
<td>H2S measurement and BMP</td>
<td>1.66</td>
<td>3.26 *</td>
</tr>
<tr>
<td>PM measurement techniques</td>
<td>1.60</td>
<td>3.20 *</td>
</tr>
<tr>
<td>PM mitigation BMP</td>
<td>1.60</td>
<td>3.26 *</td>
</tr>
<tr>
<td>Dietary changes for air quality</td>
<td>1.40</td>
<td>3.35 *</td>
</tr>
<tr>
<td>Greenhouse gases and carbon credits</td>
<td>1.46</td>
<td>3.26 *</td>
</tr>
</tbody>
</table>

n= 15 - Scale: 5= Very High, 4=High, 3=Good, 2=Fair, 1=Poor

* All results were significant at less than 1% level (paired t-test p < 0.0002)

BMP= Best Management Practices, VOCs= Volatile Organic Compounds, PM= Particulate Matter

Some comments from participants included:

- “Important information was delivered in an excellent workshop!”
- “This is a tough workshop to improve on. There was a lot of material presented and a lot to ‘digest’. Good Job.”
- “This was the best workshop I have attended. Very informative & helpful.”
- “I think that it is a good program. I do take home valuable information.”

All presentations from the WSARE program, as well as cooperators contact information, are available at the Western Odor and Air Quality Program website: http://bsyse.wsu.edu/ndegwa/main/WOAQ/ WOAQhome.html. Presentations from Idaho agencies and USEPA presenters will be available at the Gooding County Extension Office website: http://www.extension.uidaho.edu/gooding.


**FOR MORE INFORMATION**

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