

Rec'd via email 4/12/05

# California Department of Food and Agriculture

Office of Agriculture and Environmental Stewardship

1220 N Street

Sacramento, CA 95695

(916) 651-7178

April 13, 2005

Dairy Permitting Advisory Group

c/o: Dave Warner

San Joaquin Valley APCD

RE: DPAG Literature Review Comments

Dear DPAG Committee Members:

I have some comments on a reference that is being considered by the committee in development of an emissions factor for dairy facilities. The article titled "Emissions of volatile organic compounds originating from UK livestock agriculture" by Hobbs et al. from the *Journal of Science of Food and Agriculture* is a study that we referenced in a recent poultry study completed with the Air Resources Board so I am familiar with it. I found the article useful for generating a list of compounds likely to come from different types of animal manure and for development of gas analysis methodology. But I have serious reservations about using it for emissions estimation from facilities.

In the poultry study, we measured both ammonia and dimethyl disulfide (the major NMVOC compound found in poultry manure by these authors) over a complete poultry growth cycle and found the average ratio of dimethyl disulfide to ammonia was much lower than what was found in this article (about 0.08 rather than 0.69). Since these ratios are the basis of their emissions estimates, this is a concern. Without seeing confirmation of the Hobbs et al. results in the field (or laboratory) I would hesitate to draw broad conclusions based on their experimental protocol.

The experimental details and analysis are only partly described in this article. I read that the authors' placed 3-day old manure slurry in containers in an emission chamber and estimated the gas emission rate above the stirred slurry for a single point in time at the beginning of the run. This gives a snapshot of the relationship between ammonia and these other gas compounds under these (unusual) laboratory conditions. To turn their flux results into an emissions factor, the authors' took the ratio of NMVOC to ammonia under these specific conditions and assume that this ratio will translate globally to all manure handling processes at animal facilities. I'm concerned about this assumption particularly without replication in the field. In addition to the experiment not being a comprehensive analysis of slurry emissions, it does not represent typical manure conditions on a California facility where manure is deposited on drylot surfaces or collected in a dilute mixture after flushing.

I hope this is helpful. Please let me know if you have any questions.

Sincerely,

Matthew D. Summers, P.E.  
Air Resources Engineer