

Curriculum Vitae

Edward A. Caraway, PhD

Clarendon College

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Personal

Born December 15, 1970, Perryton, TX

Daughter, Bailey Ann Caraway (born Aug 19, 1996)

Veteran: Desert Storm (military service 1989 – 1993)

Professional Preparation

Canyon High School, Canyon, TX

General

1986 - 1989

West Texas A&M University

Biology

B.S. - 2004

West Texas A&M University

Biology

M.S. – 2006

West Texas A&M University

Agriculture

PhD Dec 2013

Appointments and Work Experience

2014-Present **Biology Faculty: Clarendon College.** Instruct: Biology for science majors, Microbiology, Anatomy & Physiology, and Medical Terminology. Serve as a member of the Faculty Rank committee.

2006-2014 **Research Associate: Commercial Core Laboratory - GC/MS-Olfactometry Lab Manager and PhD Candidate, West Texas A&M University, Canyon, TX.**
Manage the Commercial Core Laboratory Facility at West Texas A&M University to include Feed and Forage analysis and Odor Testing Services. Responsible for environmental and waste management research related to concentrated animal feeding operations in the Texas Panhandle. Perform applied research and work directly with producers to solve complex environmental issues. Collaborate with scientists and engineers located at the Texas A&M University Research and Extension Center in Amarillo, TX, the USDA-ARS Conservation and Production Research Laboratory in Bushland, TX and Temple, Texas A&M University in College Station, TX, and various other universities across the United States. Guest lecture undergraduate and graduate Analytical chemistry and chemistry instrumentation courses.

2012-2013 **Interim Director AR-EHS, West Texas A&M University, Canyon, TX.**
The Academic and Research Environmental Health and Safety (AR-EHS) program provides the necessary programmatic and activity-specific guidance to; address applicable environmental protection, promote student – faculty – staff safety and health requirements, and advance best management practices. Develop standard operating procedures aligned with local, state and federal regulations for safe operation in Teaching and Research Labs. Create training modules for use with new employee and annual training.

2004-2005 **50% Graduate Research Assistantship, Air Quality Research, West Texas A&M University, Canyon, TX.**
Work with GC/MS to quantify VOC concentrations from animal feeding operations in the Texas Panhandle. Design and perform analyses, statistics, and issue reports or

publications on findings. Develop methodology for both quantification and qualification of VOCs and VFAs from animal feeding operations, processing facilities and industrial applications. Utilize regulatory air quality modeling tools to estimate downwind impact of gasses and odorous VOCs downwind of animal feeding operations.

- 2004-2005** **50% Teaching Assistant, Life, Earth, and Environmental Science, West Texas A&M University, Canyon, TX.**
Prepare laboratory exercises for microbiology course, instruct and test students on proficiency of course objectives. I taught Labs for: botany, anatomy & physiology, and bioinformatics. Thesis title: *In vitro* regeneration of Sugar Beet (*Beta vulgaris* L.) via leaf explants and callusing
- 1994-2002** **Hospice, Baptist St Anthony's Inpatient Hospice, Amarillo, TX.**
Assist patients and families with end of life issues including pain, pastoral care, and other activities of daily living.
- 1989-1993** **Combat Engineer, United States Regular Army.**
Served US Army Europe prior to Desert Storm deployment. Honorable Discharge, September 1993. Stationed in Dexheim Germany.

Litigation Support

Olivera Egg Ranch Litigation Support. Lathrop Ca.

Provided sampling support for NH₃ and odor events downwind of facility.

DeRuyter Brothers Dairy, Outlook, WA.

Provided sampling support for Methanol emissions.

Ocean Protein Fish Meal processing/Envirometrics Hoquiam, WA.

Provided sample analysis for identification of malodorous compounds and recommended remediation strategies for overall odor reduction onsite and downwind of the plant.

Publications

1. Ghosh, N., **E.A. Caraway**, A.B. Das, and R.G. Dani, 2013. *In vitro* regeneration of Sugar Beet (*Beta vulgaris* L.) via leaf explants and callusing. *Annals of Plant Sciences*, 2(10), In Press.
2. Nonella, K. J., Baker, L. A., Pipkin, J. L., Parker, D. B., and **Caraway, E. A.** 2013. The effects of cranberry seed oil, flaxseed meal, and soybean oil on plasma eicosapentaenoic, docosahexaenoic, alpha-linolenic, and sum n-3 fatty acid concentrations in horses. *Journal of Equine Veterinary Science*, 33(5), 335-335.
3. Parker, D. B., Koziel, J. A., Cai, L., Jacobson, L. D., Akdeniz, N., Lim, T. T., **Caraway E.A.**, Zhang S., Hoff S.J., Heber A. J., Heathcote K. Y., Hetchler, B. 2012. Odor and odorous chemical emissions from animal buildings: Part 6. Odor activity value. *Transactions of the ASABE*, 55(6), 2357.
4. Dalton, P., **E.A. Caraway**, H. Gibb, K. Fulcher. 2011. A Multi-Year Field Olfactometry Study Near a Concentrated Animal Feeding Operation. *J. Air & Waste Manage. Assoc.* 61:12. Pp1398-1408.

5. Parker, D. B., **E. A. Caraway**, M. B. Rhoades, N. A. Cole, R. W. Todd, K. D. Casey, C. D. Donnell, J. P. Spears. 2010. Effect of wind tunnel air velocity on VOC flux from CAFO manure and wastewater. *Transactions of the ASABE*. 53:3, p. 831-845.
6. Rhoades, M. B., D. B. Parker, N. A. Cole, R. W. Todd, **E. A. Caraway**, B. W. Auvermann, D. R. Topliff, G. L. Schuster . 2010. Continuous Ammonia Emission Measurements from a Commercial Beef Feedyard in Texas. *Transactions of the ASABE*. 53(6): 1823-1831.
7. Parker, D. B., **E. A. Caraway**, M. B. Rhoades, N. A. Cole, R. W. Todd, K. D. Casey. 2010. Effect of Wind Tunnel Air Velocity on VOC Flux from Standard Solutions and CAFO Manure/Wastewater. *Transactions of the ASABE*. 53(3): 831-845.
8. Bereznicki, S.D., A.J. Heber, R.B. Jacko, N. Akdeniz, L.D. Jacobson, B.P. Hetchler, K.Y. Heathcote, S.J. Hoff, J.A. Koziel, L. Cai, S. Zhang, D.B. Parker, **E.A. Caraway**. 2010. Odor and Odorous Chemical Emissions from Animal Buildings: Part 1 – Project overview and collection methods. Paper presented at the International Symposium on Air Quality and Manure Management for Agriculture, Dallas, Texas USA, Sept. 13-16, 2010.
9. Akdeniz, N., L D Jacobson, B P Hetchler, S D Bereznicki, A J Heber, R B Jacko, K Y Heathcote, S J Hoff, J A Koziel, L Cai, S Zhang, D B Parker, **E A Caraway**. 2010. Odor and Odorous Chemical Emissions from Animal Buildings: Part 2- Odor Emissions. Paper presented at the International Symposium on Air Quality and Manure Management for Agriculture, Dallas, Texas USA, Sept. 13-16, 2010.
10. Cai, Lingshuang Shicheng Zhang, Jacek A Koziel, Gong Sun, Katie Y Heathcote, Steven J Hoff, David B Parker, **E.A. Caraway**, Larry D Jacobson, Neslihan Akdeniz, Brian P Hetchler, Erin L Cortus, Sarah D Bereznicki, Albert J Heber. 2010. Odor and Odorous Chemical Emissions from Animal Buildings: Part 3- Chemical emissions. Paper presented at the International Symposium on Air Quality and Manure Management for Agriculture, Dallas, Texas USA, Sept. 13-16, 2010.
11. Jacobson, L D, N Akdeniz, B P Hetchler, S D Bereznicki, A J Heber, R B Jacko, K Y Heathcote, S J Hoff, J A Koziel, L Cai, S Zhang, D B Parker, E A Caraway. 2010. Odor and Odorous Chemical Emissions from Animal Buildings: Part 4- Correlations Between Sensory and Chemical Measurements. Paper presented at the International Symposium on Air Quality and Manure Management for Agriculture, Dallas, Texas USA, Sept. 13-16, 2010.
12. Zhang, Shicheng, Lingshuang Cai, Jacek A Koziel, Steven J Hoff, Katie Y Heathcote, Larry Jacobson, Neslihan Akdeniz, Brian Hetchler, David B Parker, Edward A Caraway, Albert J Heber, Sarah D Bereznicki. 2010. Odor and Odorous Chemical Emissions from Animal Buildings: Part 5 –Correlations between Odor Intensities and Chemical Concentrations (gc-ms/o). Paper presented at the International Symposium on Air Quality and Manure Management for Agriculture, Dallas, Texas USA, Sept. 13-16, 2010.
13. Zhang, S., L. Cai, **E.A. Caraway**, J.A. Koziel, D.B. Parker, L. Jacobson, S.J. Hoff, A. Heber. 2008. Characterization and quantification of livestock odorants using sorbent tube sampling and thermal desorption coupled with multidimensional gas chromatography–mass spectrometry–olfactometry (TD-MDGC-MS-O). ASABE Paper No. 085164. In Proceedings 2008 American Society of Agricultural and Biological Engineers, Providence, Rhode Island.
14. **Caraway, E.A.**, D. B. Parker, K.D. Casey, M.J. Olsen, C. Donnell, M.B. Rhoades, J. Spears. Diel VOC emissions from a beef cattle feedyard. ASABE Paper No. 084136. In Proceedings 2008 American Society of Agricultural and Biological Engineers, Providence, Rhode Island.
15. Rhoades, M.B., B.W. Auvermann, N.A. Cole, R.W. Todd, D.B. Parker, **E.A. Caraway**, G. Schuster and J. Spears. 2008. Ammonia concentration and modeled emission rates from a

- beef cattle feedyard ASABE Paper No. 084445. In Proceedings 2008 American Society of Agricultural and Biological Engineers, Providence, Rhode Island.
16. Parker, D.B., **E.A. Caraway**, M.B. Rhoades, N.A. Cole, R.W. Todd, K.D. Casey, C.D. Donnell, J.P. Spears. 2008. Effect of wind tunnel air velocity on VOC flux rates from CAFO manure and wastewater. ASABE Paper No. 083897. In Proceedings 2008 American Society of Agricultural and Biological Engineers, Providence, Rhode Island.
 17. Donnell, C., D.B. Parker, **E.A. Caraway**, J. Spears, M.B. Rhoades. Zeolite amendment to minimize ammonia, hydrogen sulfide, and VOC emissions. ASABE Paper. In Proceedings 2008 American Society of Agricultural and Biological Engineers, Providence, Rhode Island.
 18. D.B. Parker, Z. Buser, **E. Caraway**, Marty Rhoades, M. Olsen, K. Casey, J. Spears, G. Green. 2007. VOC concentrations downwind of beef feedlots during intense odour events. Proc. of the 14th IUAPPA World Congress, Brisbane, Australia. September 9-13, 2007.
 19. **EA Caraway**, DB Parker, M Ruby, RG Green, JP Spears, Z Buser, M Rhodes, MJ Olsen. 2007. Analysis of Odorous Compounds from a Fish Meal Plant. International Symposium on Air Quality and Waste Management for Agriculture. Broomfield, CO.
 20. Perschbacher-Buser, Z.L., D.B. Parker, K. Casey, G. Green, **E. Caraway**, and M.B. Rhoades. 2007. Quantification of ambient para-cresol downwind of beef cattle feed yards. Accepted for publication In Int. Symposium on Air Quality and Waste Management for Agriculture, Broomfield, Colorado. September 15-19, 2007.
 21. **Caraway EA**, Alvarez R, Spears JP, Ghosh N, Olsen MJ, Parker DB. 2006. Mini Review: Cytochrome P450BM-3 in the Remediation of Semi-Volatile Fatty Acids Associated with Feedlot Odors. ASABE Paper number 064045. In Proceedings ASABE International Conference, Portland, OR.
 22. Bolanle E, Perschbacher-Buser Z, **Caraway EA**, Ghosh N, Olsen MJ, and Parker DB. 2006. Odor Control in Waste Management Lagoons via Reduction of p-Cresol using Horseradish Peroxidase. ASABE Paper number 064044. In Proceedings ASABE International Conference, Portland, OR.
 23. Ghosh, N., Mahapatra, D., **Caraway, E.**, Saadeh, C., Gaylor, M., & Smith, D. W. (2005). An investigation on aeroallergens in the public schools of the Texas Panhandle. *Journal of Allergy and Clinical Immunology*, 115(2), S22.