



Anheuser-Busch Endowed Professorship in Malting and Brewing Sciences

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Food Science and Technology

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ENDOWMENT PURPOSE

The Anheuser-Busch Professorship in Malting and Brewing Sciences was established in 1996 by the Anheuser-Busch Foundation. The purpose of this professorship is to provide a permanent source of funding for teaching and research in malting and brewing sciences. A tenured faculty member shall hold the position, and should have a demonstrated passion for the brewer's art and a scientific background in microbiology, biochemistry or food science. In addition to financially supporting the faculty professorship holder, the intent of the endowment is to also support students in their training in malting and brewing research.

RESEARCH

My current research program focuses primarily on the wholesomeness of beer, including studies on the psychophysics of beer perception, on polyphenols and on the residues from non-starchy polysaccharide digestion that constitute soluble fiber and potential prebiotics in beer. Research in the laboratory also embraces the enzymology of the brewing process, foam stability, preventing oxidation in wort and beer and alternative paradigms for beer production.

TEACHING

I continue to teach FST102A Malting & Brewing Science (lecture class) and FST102B Malting & Brewing Science (laboratory class). Both courses were heavily oversubscribed with 77 students enrolling in 102A and a record 41 student in 102B.

While I no longer teach FST3 (Food Science and Technology 3) - Introduction to Beer and Brewing, I taught an Honors Student sitting of the class in Fall 2015 that was extremely interactive with substantial individual and team work and opportunity for creativity.

I also worked extensively with IET/Academic Technology Services and the Center for Excellence in Teaching and Learning to develop an on-line version of FST3 that is expected to be available for both campus and more widespread use in 2017.

Many lectures and tutorials were given within the Extension Programs through January to June. In addition, I continued the new one-week extension class entitled Introduction to Practical Brewing. It was taught four times, in September, December, January and May, the capacity being nominally 15 people. It is taught in the classroom, lab and Anheuser Busch Inbev Brewery within the August A. Busch III Brewing and Food Science Laboratory. All proceeds from the course are put back into the campus program.

STUDENTS

Support from the fund has always been very important in the training of MS students intent on careers in the brewing industry. This year, three Masters students are completing their research:

- Joe Williams, ascorbic acid in mashing
- Abigail Kanyer, prebiotics in beer
- Emily Kultgen, foaming complexes from specialty malts

Laura Metrulas has completed her first year of studies and will research the ageing of beer. Laura will be the last MS student in the Bamforth laboratory.

OUTREACH

- I continued in my international role as President of the Institute of Brewing and Distilling and will hand the position over to my deputy in September 2016.
- I continue in my role as Editor-in-Chief of the Journal of the American Society of Brewing Chemists, as well as serving on the Editorial Boards of the Journal of the Institute of Brewing and the Technical Quarterly of the Master Brewers Association of the Americas. I have served as referee for many other journals.
- I am a member of the Food Science, Viticulture and Enology and Agricultural and Environmental Sciences Graduate Groups.
- We continue to have a high profile on television, radio and in the press.
- I was on the thesis committee of Brad Tutus, MS student.
- I acted as External examiner for a PhD Thesis in UK.
- I was part of the committee selecting the next Kinsell Endowed Chair holder.
- I have been appointed chair of a committee evaluating the performance of endowed chairs and professors on campus.
- I continue in my role as Honorary Professor, University of Nottingham, UK and have provided several lectures electronically during the year.
- We continue to reach out to the industry through our newsletter Aggie Brew.
- I continue as part of the Master Brewers Association of the Americas committee looking into the huge growth of universities and colleges seeking to teach brewing.

- We continue to be grateful to the Anheuser-Busch Foundation for ongoing annual donations of \$50,000, monies that are being used to continue the employment (currently part-time) of Joe Williams as Brewer.
- In April I organized the highly successful Young Scientists Symposium held at the Sierra Nevada Brewery in Chico, with 100 delegates from 18 countries and with the generous sponsorship of 27 companies, including Anheuser-Busch Inbev.

ACTIVITIES SUPPORTED BY FUND

The first spend on the \$1m donation was made with the purchase of 16 custom-built 10 gallon cylindro-conical vessels from JV North West.

We have performed several more contract brews on the full scale pilot brewery for outside persons seeking to develop new beers. Again, this represents a useful income stream to the program. It is gratifying to see two companies' products from this activity in the marketplace.

Additionally, I've completed the following publications and have several other articles, papers and books are in preparation.

- Porter, J.R. and Bamforth, C.W. (2016) Manganese in brewing raw materials, disposition during the brewing process and impact on the flavor instability of beer. *J Am Soc Brew Chem*, 74, 87-90
- Spevacek, A.R., Benson, K.H., Bamforth, C.W. & Slupsky, C.M. (2016) Beer Metabolomics: Molecular Details of the Brewing Process and the Differential Effects of Late and Dry Hopping on Yeast Purine Metabolism. *J. Inst. Brew.*, 122, 21-28
- Bamforth, C. (2015) Respect for Beer. *Brewer and Distiller International*, 11 (12), 30-32
- Bamforth, C.W. (2016) Enzymes, Egg White and Eccentrics: Memories from 37 Years of Research in the Brewing Industry. *J Am Soc Brew Chem*, 74, 1-15