

THE STATE OF COLORADO

20 18

LIQUID ARTS

FIELD TO FOAM FORUM



BUILDING A RESEARCH NETWORK FOR COLORADO BREWERS AND DISTILLERS

HOSTED BY

COLORADO STATE UNIVERSITY

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COLLEGE OF AGRICULTURAL SCIENCES | DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION
DEPARTMENT OF AGRICULTURAL RESOURCE ECONOMICS | VICE PRESIDENT FOR RESEARCH

EQUIPMENT AND ENGINEERING

Breakout Session Summary

Highlights

- What opportunities exist to increase both efficiency and sustainability?
- Need for guidance on how to get the most out of existing equipment and when to buy new equipment.
- Need for an unbiased reviewer on the performance and quality of equipment.
- How can quality control assist consistent replication of Liquid Arts products batch-to-batch.

Priorities and research questions for the foundation of a public/private partnership

Discussion transcript

The overarching theme of this session was best practices and guidance for breweries concerning equipment and strategies that can increase output. Four general areas of interest were identified by participants, including instrumentation and controls, process optimization, equipment solutions, and industry projects.

Within instrumentation and controls, participants discussed a range of issues. It was generally agreed upon that applicable best practices will vary by size, as will the optimal level of instrumentation. Recommended best practices based on size exist for breweries in Europe, but are absent in the U.S. Another issue brought up was consistency, or “liquid precision”, and how quality control can assist consistent replication of products batch-to-batch. A related question, “what are the critical control points?” was also discussed. Identification of these points would help producers create a more consistent product. Participants were also concerned with optimizing chemical usage, specifically as it relates to clean-in-place (CIP), and where to find general guidance on how to do this. A concern for smaller producers is that the instrumentation required to optimize CIP will be cost prohibitive.

Process optimization garnered the most interest from participants. Participants found many of their questions within this topic were related to two desired outcomes; increased efficiency and sustainability. For example, participants discussed how reutilizing heat and energy optimization is economical at all scales because not only does it reduce environmental impacts but it also helps producers get the most out of their inputs. Relatedly, participants discussed how they can most efficiently use their materials to maximize yield. They agreed on the need for guidance that accounts for the

size and experience of the producer. Academic participants suggested that statistical analysis and analytics could provide a procedural solution when buying equipment is too costly. For example, these tools can assist producers optimize the utilization of equipment and personnel currently available without requiring the purchase of costly equipment. A concern among industry participants was that many producers currently have no choice but to use vendors as their engineers. These participants suggested CSU, as a neutral party, could potentially evaluate technology and provide unbiased feedback on its quality.

The equipment solutions discussion centered around how to get the most out of current equipment and when and how to select new equipment. As mentioned above, a major concern of industry participants is the lack of unbiased reviews of new equipment. Participants identified this as an opportunity to create a framework that will help local breweries. As part of a larger Liquid Arts extension program, CSU could house a research brewery that tests the capabilities of new brewing technology and makes the results available to the industry. Another piece of this framework could be guidance on what equipment is recommended for breweries based on size and how to get the most out of it.

The final topic concerned what industry and academic participants would gain from working with each other. Industry participants suggested they can provide opportunities for students to work with them on senior projects. For this to work, the industry needs to provide insight on challenges they are facing so students can try addressing them. Industry participants were also interested in having access to university equipment for their own needs, such as a lab for hire.



Dotocracy results: 11 session participants, 78 votes

Overview of topic priority

Topic	Rank	
	Academic	Industry
Equipment solutions	4	3
Guidance	1	1
Process Optimization	3	4
Instrumentation and continuous automation	2	2

Detailed topic breakdown

Equipment solutions

- What are new ideas and trends
- Verification of manufacturer claims
- Engineering for sustainability
- Count me in: Kelley Freeman, Cy Bevenger

	Academic	Industry	Total
Breakout session votes	5	11	16
Percent	6%	14%	21%
Plenary session votes	0	4	20

Guidance

- Industry project
- Needs and ideas
- Count me in: Matt Arthur, Cy Bevenger, Jason Hevelone, Dave Bark, Josh Grentz

	Academic	Industry	Total
Breakout session votes	6	20	26
Percent	8%	26%	33%
Plenary session votes	2	4	32

Process Optimization

- Utilization of heat (energy audit, optimization, scaling)
- Yield of ingredients
- Best practices with respect to scale
- Research on chemicals (CIP)
- Guidance on vessels and piping

	Academic	Industry	Total
Breakout session votes	6	14	20
Percent	8%	18%	26%
Plenary session votes	0	10	30

Instrumentation and continuous automation

- Diagnostics and measurements
- Recontrol CIP plants
- Troubleshooting
- Connection with QC/QA
- Count me in: Kelley Freeman

	Academic	Industry	Total
Breakout session votes	7	9	16
Percent	9%	12%	21%
Plenary session votes	0	10	26



Breakout session participants and contact information

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