



# FIELD TO FOAM



RESEARCH INSTITUTE

AT COLORADO STATE UNIVERSITY

*Elevating the Art and  
Science of Brewing*

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## Elevating the Art and Science of Brewing

The brewing industry and related supply/distribution chains are major sectors of the Colorado economy. A 2018 study by the [Brewers' Association](#) estimated the economic activity generated by the craft-brewing sector alone at more than \$3 billion, employing a workforce of more than 25,000 (FTE). In addition to craft brewing, the traditional macro-brewers (i.e. Anheuser-Busch InBev and Molson Coors) have a long history of activity in the state. If one considers the indirect economic activity up the supply chain (grains production, hops, maltsters, etc.) and post-production (distribution, marketing, entertainment and tourism, inputs for distilling), it becomes clear that the brewing industry is a pivotal sector of the Colorado economy. In fact, Colorado has become the leading producer of craft beer per capita in the US.

The staggering success of the Colorado brewing industry, however, should be not taken for granted. Recent sale data show that the craft sector is becoming increasingly competitive, and growth is plateauing. Some historical macro breweries decided to relocate outside of Colorado in an effort to cut costs. COVID-19 has shocked consumption behavior, straining supply chains and threatening the very existence of the taproom-centered business model. The long-term prosperity of this thriving segment of the Colorado economy depends on its ability to tackle current and future challenges, and continue its long history of innovation.

As the land grant university in the state, Colorado State University is strategically positioned to become the premier institution for research, extension, and teaching activities related to the brewing industry, with a significant potential for public-private partnerships and positive, impactful work for Colorado. CSU faculty are already driving a multiplicity of research and teaching activities of high relevance to the brewing industry. The recently established program in Fermentation Science and Technology in the Department of Food Science and Human Nutrition is the most prominent example, but many other CSU departments/colleges host faculty expertise across a spectrum of activities, upstream and

downstream within the production process. Research programs span from wheat and barley breeding to hydroponic hops, environmental impact assessments, supply chain management, sensory analysis, nutraceuticals, branding, consumer behavior, and public policy; from Field to Foam (F2F).

Even though all key components are in place, CSU is still far from achieving its full potential. The major obstacles can be traced to the three key concepts of **reciprocal awareness, shared priorities, and resource availability**. If these challenges are not addressed in a concerted effort and resolved, we cannot expect that effective collaborations and partnerships will develop, and major opportunities will be lost.

**Reciprocal awareness** is a multifaceted idea, and relates to the internal relationships among CSU faculty, the interconnectedness of the F2F industry actors, and the dialogue between CSU and the industry. Internally, the **CSU talent and knowledge pool is dispersed** across a myriad of departments, only weakly interconnected. Faculty conducting research in the F2F spectrum are often unaware of each other's research programs and expertise. Fundraising activities are similarly uncoordinated, often leading to duplication of effort, competition, and donor fatigue. Fragmentation also means that F2F industry actors seeking to engage with CSU need to navigate through departmental websites to find the expertise they need.

Externally, the craft revolution in Colorado has created a **vital, extremely heterogeneous industry**, including neighborhood specialty breweries, renowned regional brands, and full mass scale production. While about half of the craft brewers are members of the Colorado Brewers Guild, no association can represent the whole industry and speak with a single voice. The picture becomes even more complex if one considers the complete F2F supply chain. Markets for inputs are both local and global, and the distribution system is heavily regulated under the three-tier system (imposing separation of production, distribution and retail) and an ever-changing set of laws. It follows that, to effectively engage and coordinate with the F2F industry, a system perspective is crucial.

The concept of **shared priorities** relates to the need to establish **win-win private-public partnerships**. CSU researchers are rewarded for creating generalizable knowledge that can be published in academic journals and training the next generation of scientists and experts. F2F industry actors need solutions to very specific problems, possibly in a short amount of time. Industry needs are also diverse. Smaller breweries with limited experience are often concerned with production-related problems, while mass producers are more interested in



tackling the broader public good issues (e.g. sustainability, diversity, alcohol awareness), which often require an interdisciplinary, systemic approach. The ability to deliver positive outcomes on all fronts will yield the greatest level of success.

**Resource availability** is the last crucial obstacle. Federal funding in the F2F space is limited, most of it going to foundational research, which is of scarce immediate relevance to industry partners. More applied grant programs (e.g. USDA NIFA) focus on agriculture and commodities, and are only tangentially related to the brewing industry. Industry-sponsored programs do exist (e.g. from the Brewers Association and other consortia), but they are generally focused on solving production issues and award relatively small amounts. Several CSU faculty have been able to secure these grants and engage with the F2F industry, but these projects are very costly in terms of faculty time and resources. While the brewing industry has been generous to CSU, large donors are seldom interested in funding research efforts benefiting the whole industry, and the many small breweries are unable to provide funding for university efforts.

**The Field to Foam Institute bridges the gap between CSU research programs and the Colorado brewing industry.** We do this by establishing long term, public-private funding partnerships and facilitating the creation of interdisciplinary teams; taking a systemic, field to foam approach to create new knowledge and address crucial challenges affecting the whole Colorado brewing industry. As we currently envision it, the activities of the F2F institute will be strategically focused on promoting awareness, create a framework for shared priorities and securing funding for research projects:



- » The F2F institute provides a unified catalogue of the expertise and ongoing research relevant to the field to foam space. We provide the opportunity for industry to easily engage directly with academic researchers and for faculty to collaborate across disciplines. The institute also organizes recurrent F2F conferences facilitating dissemination of research results and interaction among F2F actors. While located at CSU, the institute has a clear outward communication strategy to communicate and listen to the F2F industry. The impacts will also positively affect the broader CSU community and the general public.
- » The board of the institute is composed of academics and industry representatives across the F2F spectrum. The principal duty of the board is to set the criteria for evaluating research proposals, publish recurring RFPs, and score/prioritize research funding. The board will incentivize research projects to balance academic and industry objectives, interdisciplinary approaches, and training of graduate students.
- » In the long run, the institute should be fully self-sustaining and externally funded, with the larger part of its budget invested in research funding and dissemination of results. The funding model could be based on multiple mechanisms and is the most challenging part to execute. An ideal mechanism would generate a steady stream of funding, and enough resources to support impactful projects. Opt-in schemes would probably be ineffective given the public good nature of our objectives. The Cannabis Institute at CSU Pueblo provides an appealing funding model, with a fee added to sales excise taxes. However, volume-based taxes can be controversial, as mass producers would carry most of the burden. One idea would be to cap the maximum per-firm contribution. Based on a back of the envelope calculation, a “penny-a-pint” tax would generate \$9 million/year. This is more than what is needed, so capping seems viable.

The successful institute will cultivate dynamic university-industry collaborations, yielding robust academic research with demonstrable positive impacts across industry sectors.

*The institute will coordinate dynamic industry cooperation across the university to cultivate impactful academic research and robust long-term relationships.*





# Execution Strategy and Timeline

The F2F Institute will be more likely to succeed if built in a step-by-step manner over time and by garnering broad support from across CSU and the brewing industry. Over the past several years we have developed a team with representatives from all eight Colleges and diverse industry partners. The current vision builds on the successes and information gathered at the Liquid Arts Research Forum (LARF) and the PRECIP program. The following timeline summarizes the major past and future steps towards building the F2F Institute.



## MAY 2018

### LIQUID ARTS RESEARCH FORUM (LARF)

- » First step to build awareness of a broad CSU effort to engage with the brewing industry
- » Brought together CSU faculty and the brewing industry. Keynote by Gov. Hickenlooper. Funding from CAS, OVPR and FHSN.
- » Identified research priorities that are of interest to CSU faculty and the brewing industry (Building the Colorado Brand, Sustainability, Quality Control, Beer Distribution Strategies, Ingredients and Raw Materials, Equipment and Engineering)

## JANUARY 2019

### FIRST RESEARCH PROJECT FUNDED AS A RESULT OF LARF

- » Beer in grocery stores project (USDA FSMIP, \$138,000).
- » CSU researchers from 3 Colleges partnered with Colorado Brewers Guild.

## MARCH 2019

### PRECIP AWARD FUNDED (\$5,000)

- » Team has representatives from Colleges across CSU and industry representation
  - Engage with College administrative leadership across all colleges
  - Present proof of concept for a F2F Institute to key industry partners. Elicit feedback.
- » Build agreement on F2F Institute vision engaging faculty and industry partners on the F2F spectrum
- » Identify and tentatively select cross-cutting research themes for CIP research proposals

## SEPTEMBER 2020

### CIP-FUNDED PROJECT BEGINS

- » Fund research projects and begin work
- » Marketing campaign:
  - Develop website showcasing F2F faculty and industry partners
  - Publicize research projects and goals of the Institute
  - Showcase at Brewers' summit
  - Engage with legislators and lobbying groups
- » Apply for designation as a CSU CIOU
- » Determine funding model for long-term sustainability (Penny-per-pint, Market Order/Industry check-off program, other?)

## SEPTEMBER 2022 AND BEYOND

### CIP-FUNDED PROJECT ENDS

## 2022 AND BEYOND

### FIELD TO FOAM RESEARCH INSTITUTE IS FOUNDED

- » Long term funding model in place
- » Establish steering committee and solicit research project proposals
- » Hire supporting staff, public RFPs, broaden potential research scope



**FIELD TO FOAM RESEARCH INSTITUTE**  
Colorado State University  
<https://foodsystems.colostate.edu>