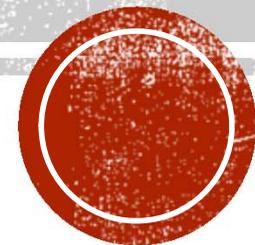# TWO-SITE BREWING OPERATIONS AND FLAVOR MATCHING

Tim Matthews and Eric Baumann

Oskar Blues Brewery

BREWERY OVERVIEW

Longmont
- 50 BBL Brewhouse
    - Mash/Lauter Tun w. Pre-masher
    - Wort Receiver and Brew Kettle with Internal Calandria
    - Whirlpool with sloped flat bottom

- Cellar
    - 100bbl and 200bbl Fermentation
    - 100, 200 and 400 bbl Brite tanks
    - 20 sq Velo D.E. Filtration

Brevard
- 50 BBL Brewhouse
    - Mash/Lauter Tun w. Pre-masher
    - Two Brew Kettles with Internal Calandrias
    - Whirlpool with sloped flat bottom

- Cellar
    - 100bbl and 200bbl Fermentation
    - 100, 200 and 400 bbl Brite tanks
    - 20 sq Velo D.E. Filtration

Lab and Packaging almost exact duplicates between Longmont and Brevard

WATER

	Longmont	Brevard
Alkalinity	30	31
Calcium, ppm	2 - 7	.9 – 9
Magnesium, ppm	.1 - .9	.2 – 1.2
Sodium, ppm	11 – 19.6	11 – 21
Sulfate, ppm	16 -18	1 – 5
Chloride, ppm	2-5	20 - 25
Chlorine (Free/Total)	0 - 0.01 / 0 - 0.02	0.01 - 1.1 / 0.02 - 1.2

- Both locations are soft surface water.
- Analyze water for Total Chlorine and Free Chlorine, **weekly**
- Analyze wort to audit Mash Tun and Kettle salt additions, and to see malt ion contributions, **quarterly**
- Analyze beer to audit the consumption by yeast of ions and to see final contribution of ions that contribute to flavor, ie. Sulfate, Chloride, Sodium/Potassium, **quarterly**
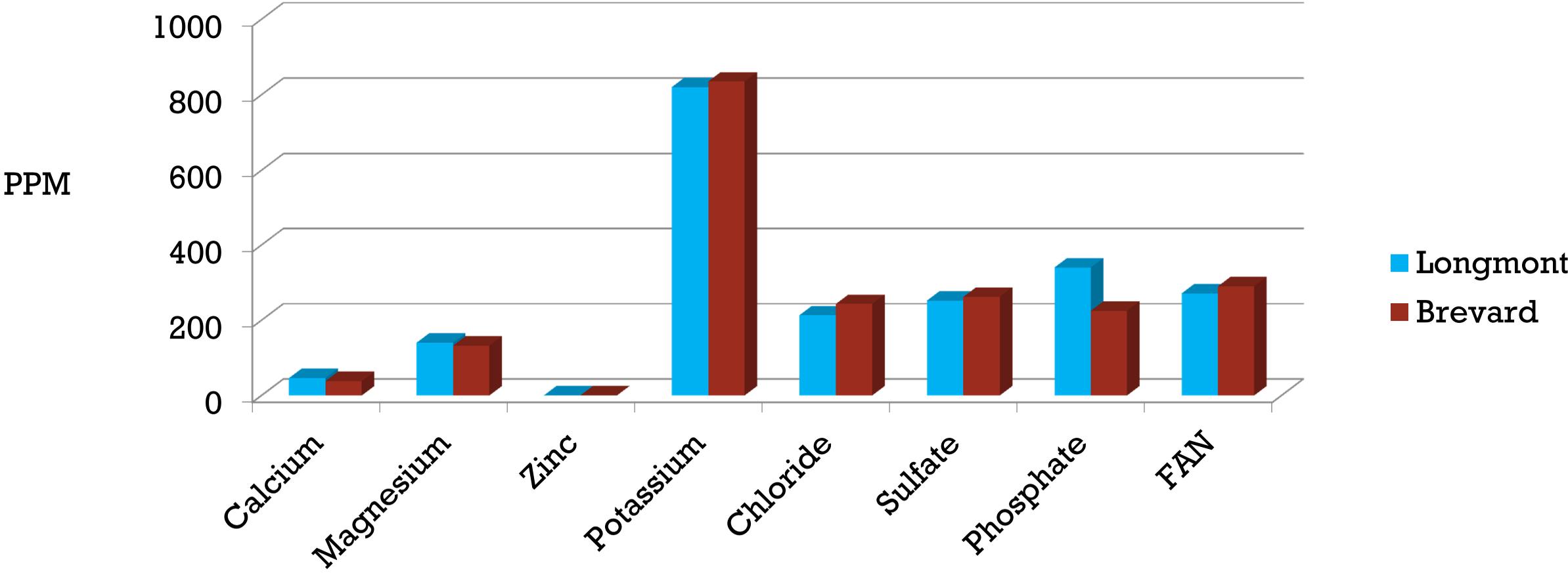- Currently, all wort and beer ion analysis is done off-site.

WORT ANALYSIS

Analysis done in mg/L	Longmont PALE ALE	Brevard PALE ALE
Calcium	46	38
Magnesium	140	132
Zinc	0.524	0.504
Potassium	820	835
Chloride	213	243
Sulfate	252	262
Phosphate (as Ortho)	340	225
Free Amino Nitrogen	271	290

WORT ANALYSIS

BEER ANALYSIS

	Brevard DPA A	Brevard DPA B	Brevard DPA C	Longmont DPA A	Longmont DPA B	Longmont DPA C
Color	14.5	15.0	20.0	19.9	19.0	14.7
IBU	66.6	48.8	65.0	63.1	61.0	65.7

	Longmont DPA A	Longmont DPA B	Brevard DPA A	Brevard DPA B
FAN	148	170	190	164

RAW MATERIALS

- Malted Barley

  - 2row – Blend of Copeland, Meredith, Metcalfe and Expedition

  - Sieve tests, using #10, #14, #18, #30, #60, Bottom Pan

  - Same specialties, same malthouse, same amounts.

- Hops

  - Multiple lots from multiple suppliers

  - Ship and store the same at both locations.

  - Blend of lots for aroma hops (Whirlpool and Dry Hop). 3+ lots or varieties for most applications

BREWHOUSE OPERATIONS, SPECIFIC CHALLENGES

- Time targets for Mash, Lauter, Boil, and KO

- Target pH, First Runnings, Last Runnings, Preboil and KO

- Manipulate pH with Food Grade Phosphoric Acid at both locations

- Evaporation and Isomerization a challenge due to difference in Elevation

- Process changes due to equipment constraints

- Different brewhouses = Different Process SOPs

- CIP/SIP SOP consistent between brewhouses

CELLAR OPERATIONS

- Parallel SOP's

- Yeast management

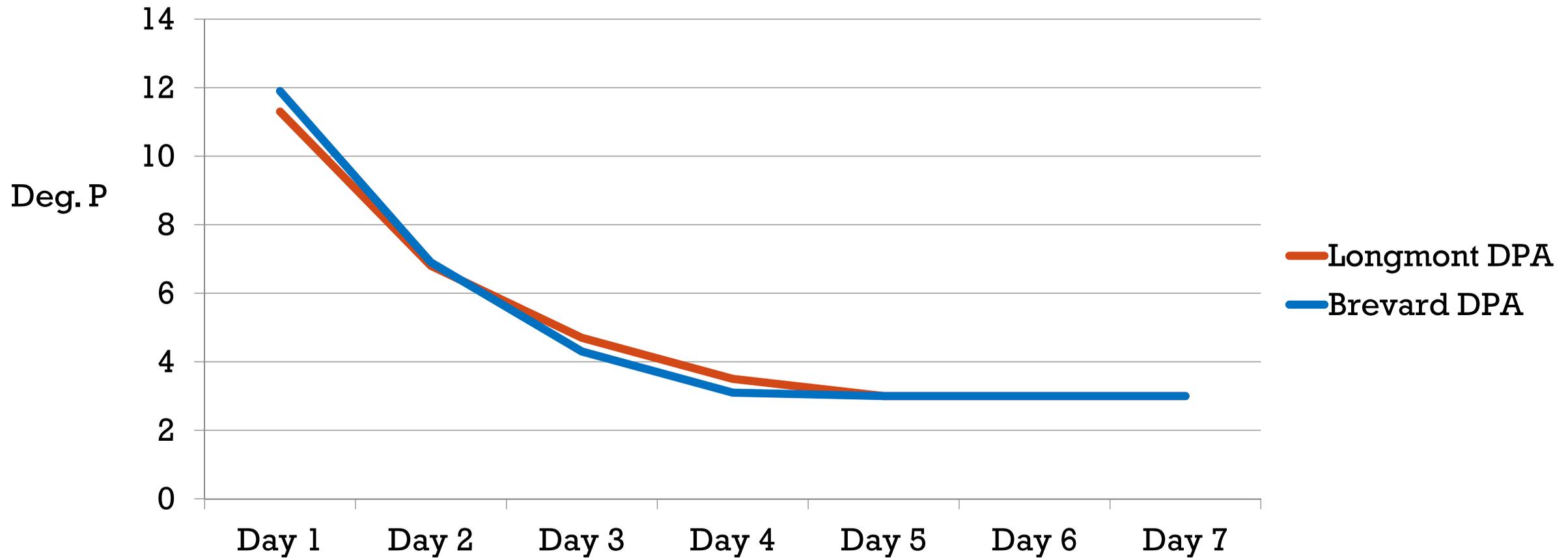- Similar ,or even better, the same equipment; i.e. filtration, carbonation and tank sizes
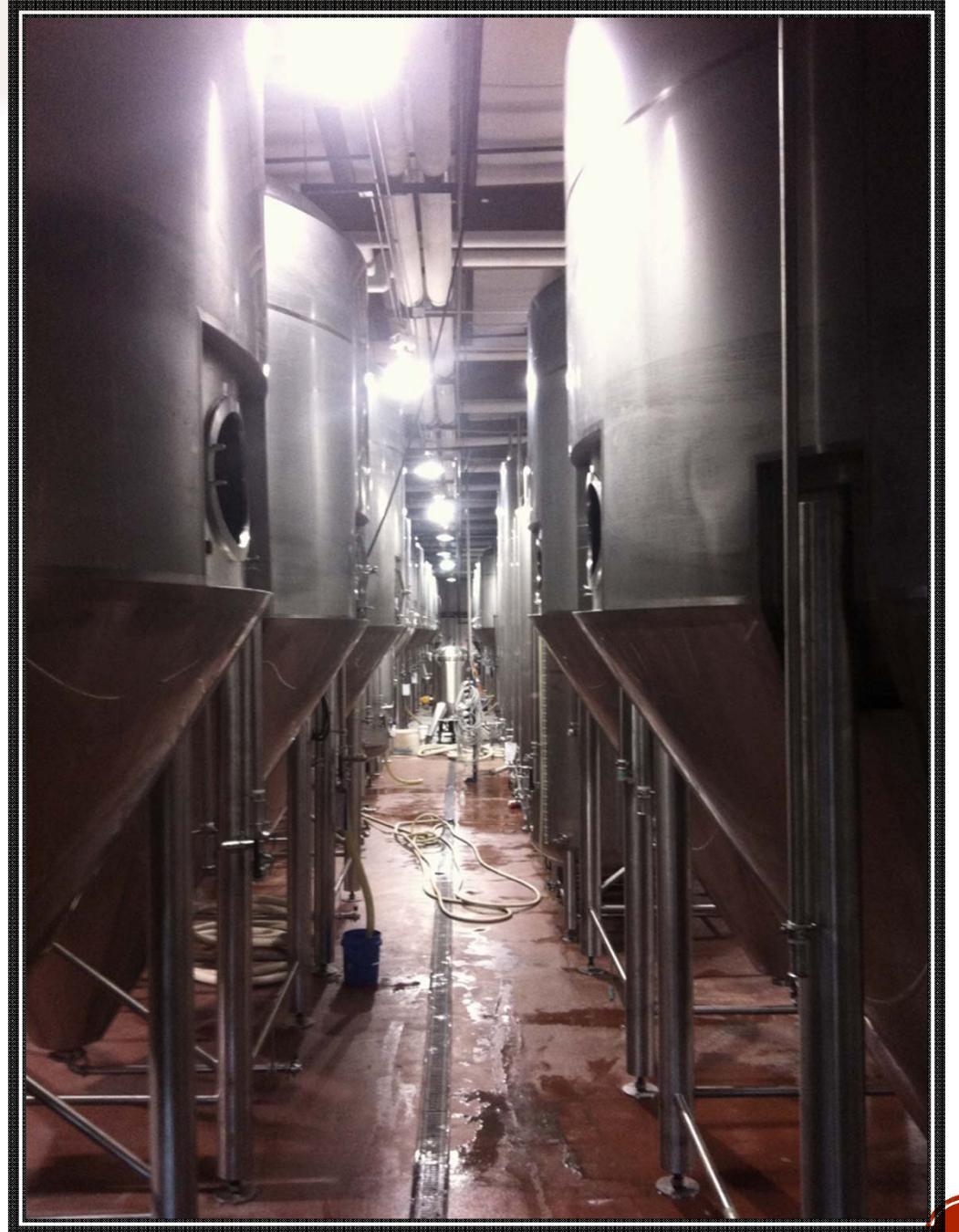
CELLAR OPERATIONS

- **Communication**

- Identify and set ideal fermentation curves and trends

LAB METHODS

- Parallel SOP's

- Build strong program

- Communication between breweries

- UV spectrophotometer: Color, IBU's, VDK

- Anton Paar

LAB METHODS

- Utilize both labs and product to cross calibrate instruments

  allows both breweries to talk apples to apples

- Utilize UV spectrophotometer to standardize VDK & Acetaldehyde levels to determine when to drop the temperature of the beer

- Routinely trade beer to cross check Anton Paar testing

- Set product aside to use as standards for IBU & SRM and trade back and forth

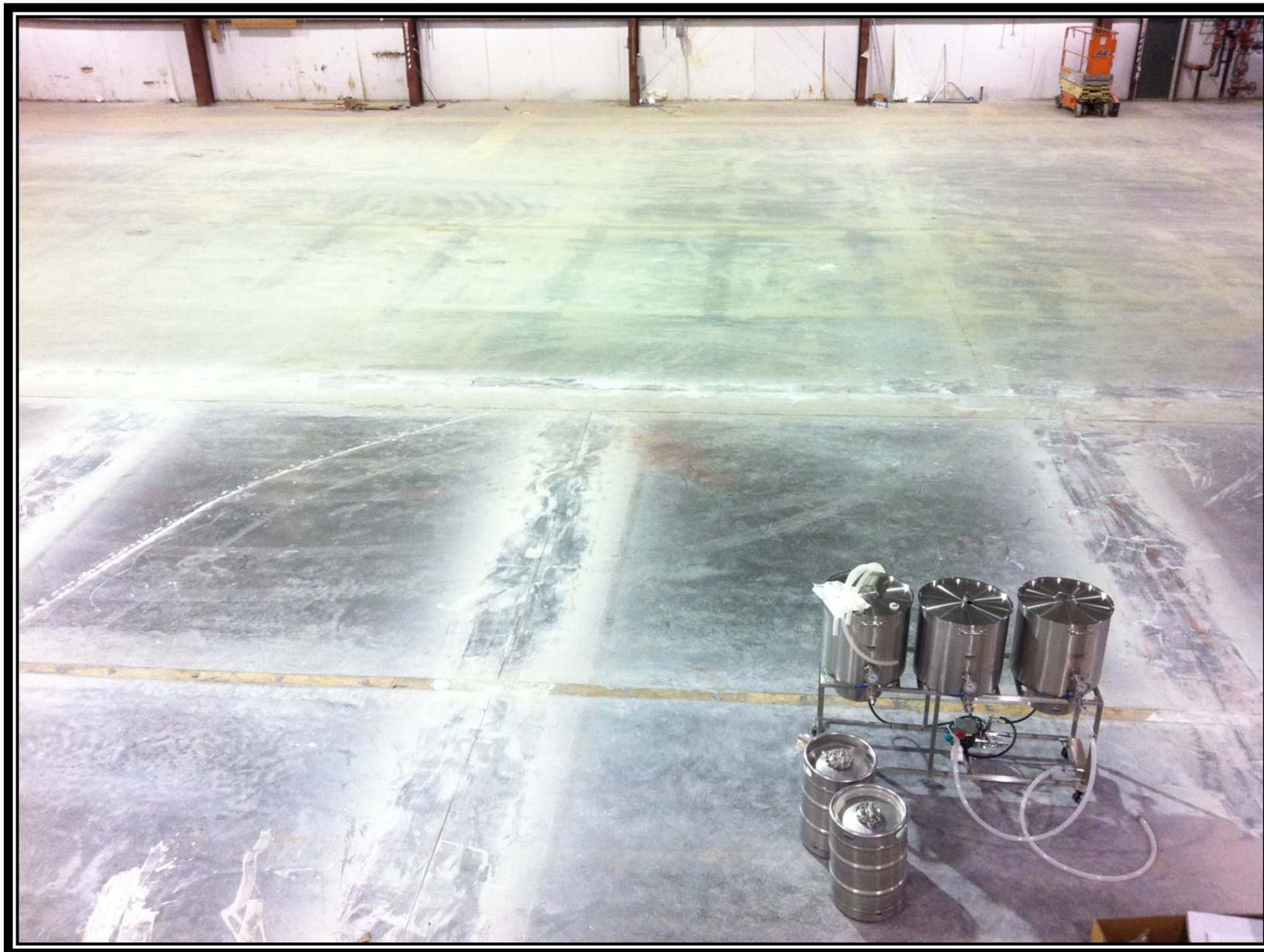- Swap fresh product between breweries to calibrate VDK, Acetaldehyde test methods

SENSORY ANALYSIS

- Beer exchange

- Overnight Vs. ground shipping

- Sharing of tasting notes

- What tastes better?

COMMUNICATION

- Distance highlights communication flaws

- Share access to all data

- How to develop and work with two teams

- QA, brewing, cellar and production meetings

- Use technology to your advantage for communication

- Rule by committee