



# Public University State Programs: Fermentation Science

HECC Funding and Achievement Subcommittee  
February 10, 2016



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# Economic Value Benefits

## *Agricultural Inputs*

Grapes

Milk

Barley, malt, hops

Barley

Wheat

Fermentation  
Sciences

## *Value Products*

Wine

Cheese

Beer

Bread

Bread

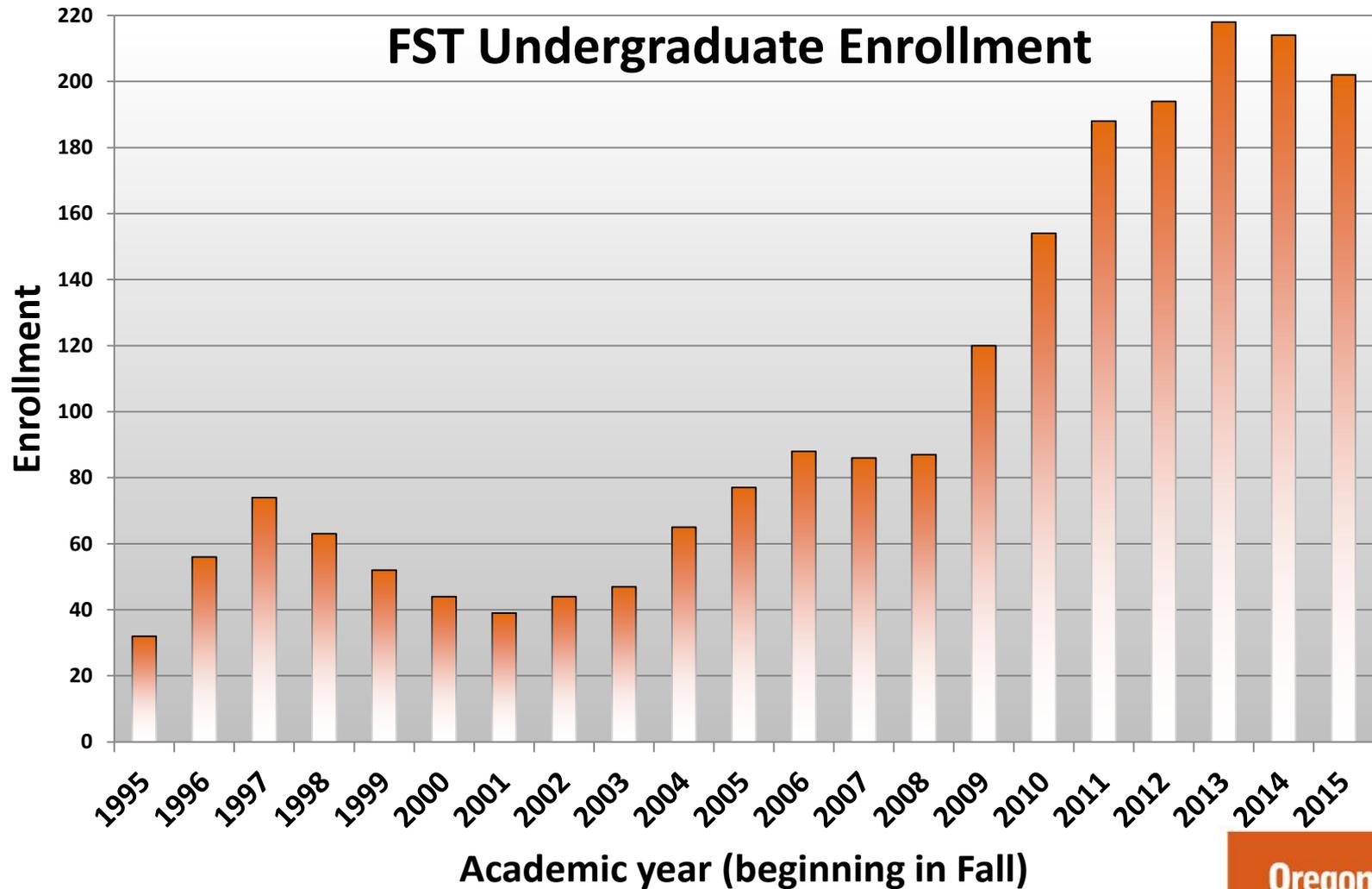
# Public University State Programs at OSU: Fermentation Science



- Launched in 1996 with endowment of *Nor'Wester Professorship in Fermentation Science* by Jim Bernau
- One of two leading programs in Fermentation Science
- Breadth: Enology, brewing, artisan cheese, artisan bread, distilled spirits
- Explosive 20-year enrollment growth which parallels that of Oregon's fermentation industries

# Public University State Programs at OSU:

## Fermentation Science



# Public University State Programs at OSU: Fermentation Science



- Highly supported through recurring Legislative funding:
  - \$2.5 M over two biennia
- Recent \$1 million gift from Gambrinus / Carlos Alvarez to fund a precision OSU pilot brewery
- Numerous support gifts from fermentation industries:
  - King Estate Brandy still
  - Paul Arbuthnot / Sunshine Dairy Creamery renovation
  - Miller Brewing Pilot-scale bottling line
  - Boston Brewing Keg washer

# Public University State Programs at OSU: Fermentation Science

## Undergraduate Degree Programs

*B.S. Degree in Food Science and Technology\**

- Food Science 29%
- **Fermentation Science 60%**
- Enology & Viticulture 11%



*\* Approved programs by Institute of Food Technologists*

# Skilled Workforce Development

## Hops, Barley, Beer



Photo: Steve Werblow

**Oregon State**  
UNIVERSITY

# Educating students to be quality brewers

*“Oregon Ethos”*



Photos courtesy of Lynn Ketchum

# Skilled Workforce Development

## Grapes and Wine

OSU teaching vineyard and winery

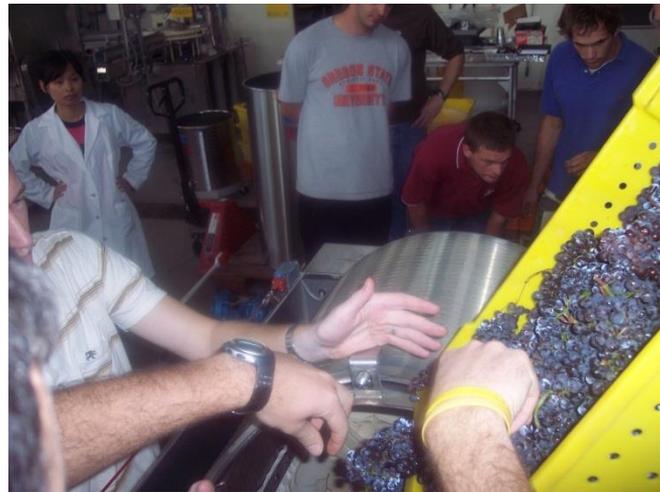
**Hands-on training:** Woodhall Vineyard, OSU Winery

Student-directed **winemaking projects**

Guest lectures from local winemakers

Focus on developing strong understanding of **foundational sciences** and their **direct application** to winemaking; “Oregon’s Ethos”

**Graduates** placed in wineries in OR, WA, and CA including Willamette Valley Vineyards, King Estate, Argyle, Lemelson, Hogue Cellars, E&J Gallo



# Wine and Grape Research

Profs. James Osborne, Elizabeth Tomasino Labs

- Understanding factors impacting wine quality; **biochemical precursors**
- Positive and negative contributions from **microorganisms**
- Chiral isomers related to wine **flavor and aroma** impact
- **Influence of yeast** on grapes and in the winery – Regional differences? Winery differences? Commercial yeast vs. naturally present yeast? Role in producing unique, premium quality wines?
- **Collaboration** with *Oregon Wine Research Institute* team including viticulturists, flavor chemists, sensory scientists



# Skilled Workforce Development

## Distilled Spirits

Asst. Prof. Paul Hughes (Heriot-Watt University, Scotland)

### Newest program in OSU Fermentation Sciences (2015)

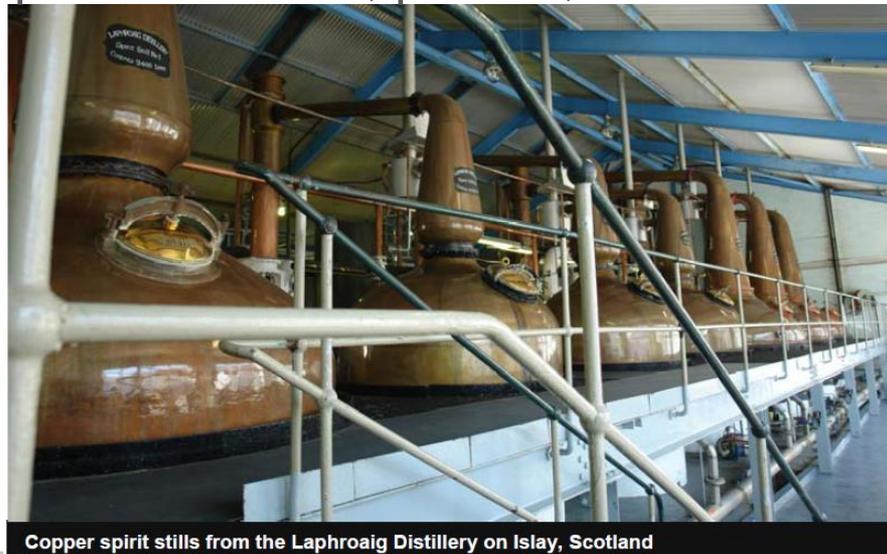
Unique offering among USA fermentation programs

Oregon presently has 69 distilleries, producing over 400 products

Oregon distillers generated \$53 million in annual sales [www.oregon.gov](http://www.oregon.gov)

Introductory FST Class: FST 399 *Global production of distilled spirits*

Dr. Hughes start-up: Column still, pot still, lab-scale distillation equipment



Copper spirit stills from the Laphroaig Distillery on Islay, Scotland

# Cereal Chemistry and Barley

Profs. Andrew Ross, Pat Hayes Labs

- Cereal breeding/genetics program
- **Malted barley** for beer production (OSU Mini-malter)
- Artisan **sourdough breads**
- Tailoring **protein / starch functionality** in cereal grains (wheat, barley)
- Bio-fermentates from cereal fractions



# Skilled Workforce Development

## Cheese and Dairy

Prof. Lisbeth Goddik

*Beaver Classic™ Cheese Program* Robin Frojen



Oregon State  
UNIVERSITY



OSU Fermentation Science 2013 alum:  
Parker Cooper (QA Manager, Rogue Creamery)



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