PVSS Presidential Banquet

Goose Island Brewery
Chicago, IL
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HomeBrewing: Why We Should All Make Beer and Lots of It

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“I would have been a lot more popular if I knew how to do this when I was 17 years old!”
Fermentation – Anaerobic Phase

pyruvic acid → acetaldehyde → ETANOL

Embden-Meyerhof-Parnas Pathway
Homebrew History

• Between 8,000-13,000 years ago
  – Transition from nomadic hunters/gatherers → farming

• 4,000 -5,000 year ago
  – Sumerian tablets – Sikaru - “world’s oldest beer recipe”
    • barley → bread + water → mash
    • “exhilarated, wonderful, blissful”
    • clay jars with beer residue
    • Ninkasi – “Goddess of Brewing”

• Egyptians, Greeks, Romans
Homebrew History

• Christian Abbeys (Roman Catholic)
  – centers of agriculture, knowledge, science
  – refined techniques
  – “for the Brothers”
  – pilgrims
  – financing community

• Belgium lambic & kriek
Homebrew History

• World View – Many Classic Styles
  – Belgium
  – Germany
  – Austria – Lagers
  – Bohemia – Pilsner
  – England – Ales
  – Ireland – Dry Stout
  – Northern France
  – Switzerland
  – Japan / Thailand
  – Caribbean

• North America
  – American beer
  – Microbrew Pubs
Homebrew – Is It Legal?

• Yes, Yes, YES !!!
  – Personal use only
  – Don’t sell it

• 1920-1933 Prohibition
  – The Dark Age of Beer Making
  – Clandestine home brew

• End of Prohibition - Legal
  – Commercial production
  – Homemade wine
  – Stenographic error (“and/or beer…”)

• 1979 Federal restriction on homebrewing beer repealed
  – Thank you, President Carter!
Homebrew – Equipment

- Big boiling pot (Wort)
- Big plastic bucket (5 – 10 gallon)
- Glass carboy (5 gallon)
- Rubber stopper (w/ and w/o hole)
- Fermentation lock (Waterseal)
- Some plastic tubing (3/8inch)
- Funnel
- Thermometer
- Hydrometer
- A lot of bottles
- Bottle caps / Capper
Homebrew – Malted Barley
“color, sweetness, body”

• Malted barley
  – grain + water $\rightarrow$ germinates $\rightarrow$
    dry malt
  – Releases sugars, soluble starches, diastase (enzyme)

• Mashing
  – grinding malt – removes husk, kernel ground fine
  – Water – dissolves malt
  – Malt extract

• Specialty Malts
  – Black patent, chocolate, crystal, roasted barley, carapils, Vienna, Munich
Homebrew – Water
“essential minerals & flavor”

• Humans are 60-70% water, Beer is 90-95% water…

• Used in all parts brewing process
  – malting, mashing, boiling, fermentation, cleaning, tasting

• Water quality

• Minerals
  – Gypsum (CaSO₄) and NaCl
Homebrew – Hops
“bitterness & bouquet”

• Cone-like flower - hops vine

• Properties
  – Antiseptic - Inhibit beer spoiling bacteria
  – Preservative - flavor stability & head retention
  – Lupulin glands - Resins & Oils - Bitterness

• Used at different stages of brewing

• Many different hops varieties
  – Regional variations
  – Fresh, pellets, oils, hopped malt extract
Homebrew – Yeast
“the workhorse”

- **Beer Yeast**
  - Ale (“top fermenting”)
    - *Saccharomyces cerevisiae* - high temperature range (65-75°F)
  - Lager (“bottom fermenting”)
    - *Saccharomyces uvarium* - low temperature range (45-55°F)

- **Yeast behavior - Fermentation**
  - Live microbial organism (nutrients)
  - Metabolism (aerobic respiration → fermentation)
  - Life cycle (reproduction)
  - Variable behavior patterns (ingredients, pH, temperature, oxygen, volume)

- **Added flavor notes**
  - sweetness, dryness, texture, fruity, grassy
Homebrew – Herbs, Spices, and More
“unique flavors”

- **Other sugars**
  - brown sugar, molasses, date sugar, turbinado
  - corn syrup, sorghum, maple syrup, rice syrup
  - honey
  - carmel

- **Fruits**
  - cherry, rasberry, currants, peaches, apples, pears, blueberries, etc...

- **Vegetables**
  - chili peppers, pumpkin

- **Other grains**
  - wheat, rye, oats, rice, corn, millet, quinoa, triticale, ...

- **Herbs & Spices**
  - cinnamon, coriander, ginger, licorice, spruce, cardomon, cloves, allspice, nutmeg, horseradish, walnut, peppercorn, basil, root beer extract, anise, juniper, vanilla, etc...

- **Miscellaneous**
  - chocolate, garlic, smoke, coffee
Homebrew – Finings
“clarifying & clearenness”

- Irish Moss
- Gelatin
- Isinglass
- Papain
- PVP
- Activated silica gel
Homebrew – How to Brew
“Five Easy Steps”

- Sanitize
- Boil – Wort
- Sparging
- Fermentation
  - open vs closed
  - single vs double stage
  - racking
- Bottling / Waiting…..
Homebrew – How to Brew
“Five Easy Steps”

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Homebrew – How to Brew
“Final Step”

ENJOY!
Homebrew – Why You Should Do It!

• You already like beer, so why not drink more beer

• There is nothing better than the taste of fresh beer made by you.

• You can make any kind you want without leaving your house

• Self-reliance
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- Easy & Fun
- Less expensive
- Practical science
- Tribute to human history
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• Easy & Fun
• Less expensive
• Practical science
• Tribute to human history
• It’s cool to do
• You will make lots of friends!
Homebrew – Resources

• Local brew supply shop

• You can find anything on the web
  – Supplies
  – Recipes

• Alternative Beverages – NC (www.ebrew.com)