Beer Ingredients & Their Flavor Contribution

30 Minutes

4 Main Ingredients in Beer—Water, Malted Barley, Hops, Yeast

1. Water
   a. 90% plus of finished beer
   b. Clean
   c. Mineral requirements: CaCl, CaSO4, NaCl, CaCO3
      i. Desirable flavor contributions
      ii. Essential to beer production
   d. Famous brewing waters: London/Burton-on-Trent, Pilsen
   e. Chlorine—must remove b/c gives medicinal flavors

2. Malted Barley
   a. Cereal grain
   b. Basic Malting Process = similar to planting a garden in steps i. and ii.
      i. Steep—awakens seed
      ii. Germinate—enzymes activated, starch breakdown begins
      iii. Kiln/Roast—dries seed and develops flavor and color
   c. Primary flavor contribution = sweetness from sugars
   d. Varieties and process create wide range of flavor and color
      i. pale = sweet, bready, biscuit; yellow/golden
      ii. crystal/caramel = toffee, caramel, raisiny; amber/red
      iii. roasted/chocolate = coffee, chocolate; brown/black

3. Hops
   a. Green, pinecone-like flower from fast-growing bine (plant that climbs by its shoots growing in a helix around a support vs. a vine that climbs using tendrils or suckers). Stems of many bines are rough or have downward-pointing bristles to aid their grip.
   b. Selective growing areas, 35-55 degrees latitude north or south (day length during growing season, as determined by latitude, has a major effect on yield)
   c. 70+ varieties
   d. Primary flavor contribution = bitterness
   e. Characteristic in beer determined by variety selected and how used.
      i. Bittering = higher alpha acids and added at beginning of the boil
      ii. Flavor/Aroma = lower alpha acids and added at end of boil, in whirlpool, and end of fermentation, e.g. dry hopping
   f. Flavors and Aromas = grassy, floral, citrus, spicy, piney, lemony, earthy, musty

4. Yeast
   a. Unicellular fungus
   b. Fermentation
      i. Converting Sugar into Alcohol and Carbon Dioxide along with other flavor compounds
   c. Ale Yeast vs. Lager Yeast
      i. Temperature differences
      ii. Flavor differences: ales = more fruit-like aromas/characters, lagers = more crisp and fewer fruit-like aromas/characters
   d. Plays a large part in flavor development of beer.