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Four Points by Sheraton Denver Southeast
HOMEBREWING with ALTITUDE

Innovations in Wheat Beer Brewing

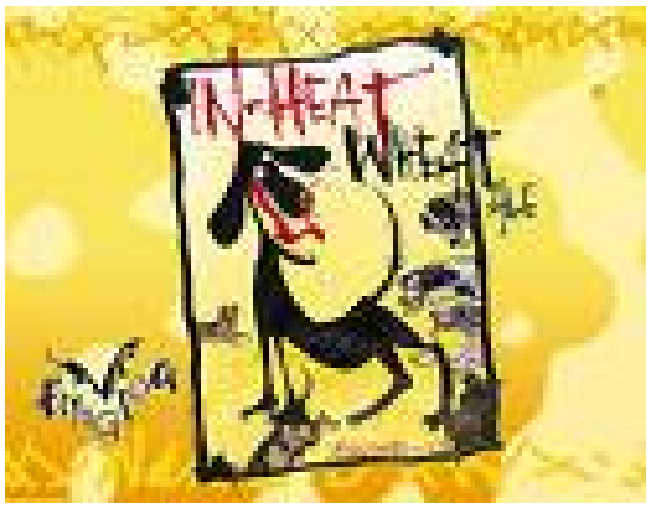
By Eric Warner

- Wheat Beer Market Trends
- German/Bavarian Hefe Weizen
  - Ingredients
  - Mashing and Wort Boiling
  - Fermentation Profiles
  - Finishing and Packaging
- Belgian-Style Wit
- Tanal A
- What we do at Flying Dog

BLUE MOON

Hoegaarden
White beer - Bière blanche

Original
SCHNEIDER
WEISSE
HUPF-WEISSBIER


IN-HEAT
WHEAT

HEFEWEIZEN
WIDMER
BROTHERS
wheat beer

Wheat Beer Growth Trends in US and Germany

- Barely 500,000 hl in Germany in early 60s, now over 10 MM. Continues to be Germany's fastest growing style
- American brewed wheats make up almost 10% of 'craft' category and one of the fastest growing
- FD's IHW 2nd fastest growing SKU

Hefe Weizen Ingredients

- Munich Area Water
  - Total Hardness 265 ppm
  - Alkalinity 255 ppm
  - Calcium Hardness 190 ppm
  - Magnesium Hardness 75 ppm
  - Sulfate 9 ppm
  - Chloride 2 ppm
- Malts
- Hefe (House Yeast)

Mashing and Wort Production

- Larger Breweries not Decocting any more
- Step Infusion Mashes
- Hopping
- Aeration

Hefeweizen Fermentation

- Add 10 degrees C to the Farmer’s Rule
- Small brewers still traditional
- Large Brewers all closed tanks
- Some Krausen, Some use Speise (reinheitsgebot)

Influence of Key Variables on Phenolic Compounds, Esters, and Higher Alcohols

	Phenolic Compounds	Esters	Higher Alcohols
More Wheat Malt	**Minimal**	**minimal**	**+**
Decoction/Well Modified Malt	**Minimal**	**minimal**	**-**
Lower Aeration	**Minimal**	**++**	**+**
Lower Pitching Rate	**Minimal**	**++**	**+**
Increased Fermentation Temperature	**++**	**+**	**++**
Shallower Fermentation Vessel	**+**	**+**	**minimal**
Speisen	**+**	**minimal**	**minimal**
Yeast Strain	**+++**	**++**	**+**

Finishing and Packaging

- Traditional Methods
  - Speise
  - Kraeusen
- Modern, Large Brewery Methods
  - Centrifuge or light filtration
  - Flash Pasteurization
  - Some Tank Conditioning

Belgian Style Wit Beer

- Hoegaarden (45% unmalted wheat)
- Long Infusion mash with multiple rests
- Continental European Hops
- Spices at end of boil, finely ground, roughly similar amounts (1/2 oz. per 5 gal.)
- Yeast strain important, but not as critical with German Wheat
- Ferment below 68, underaerate

Turbidity without Yeast

- Tanal A creates turbidity, Tanal B reduces it
- Gallotannin derived from plants, harmless
- Helps keep yeast in suspension and maintains colloidal haze
- 4.5 g/bbl, slurry first w/ beer or de-aerated water
- Non-reinheitsgebot (pasteurization)

In Heat Wheat

- Slightly less than 50% malted white wheat
- 7% Munich
- Strike Temp 168, Bed Temp 152-154
- Perle early on, longer boil
- Proprietary strain
- Lower pitch rates and aeration
- Fermentation Temp. in low 60s
- OG 12/AE 3

Woody Creek White

- Belgian Pilsner Malt, 1/3 unmalted wheat, 10% malted wheat
- Target mash temp 150-152
- 2.5 lb/bbl. Coriander, 4 lb/bbl orange peel 10 minutes B4 end of boil
- Styrian Goldings and Saaz
- Ferment at 68, Wyeast 3944
- Tanal A into brite tank
- OG 11.7/AE 2.5