

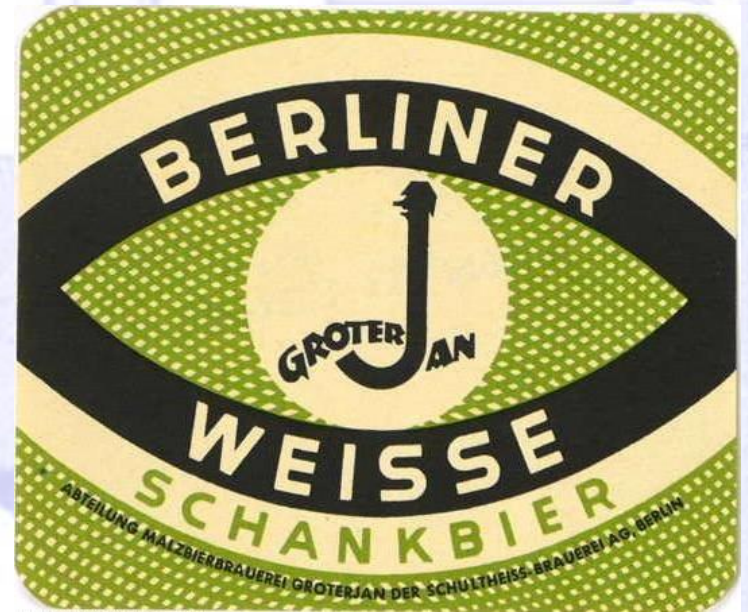


# Berliner Weisse

A local style close to extinction

# Introduction

- All beer styles change over time
- Adapt to changes in law & technology
- Berliner Weisse is sad state
- 1 example left
- Not very authentic
- Tiny amount from Bogk



# Origin of Berliner Weisse

- Two theories:
  - Brought by Huguenot refugees:
    - No real evidence
    - Weissbier predates 1600
  - Development of Broyhan:
    - Broyhan popular in N. Germany
    - Shares features with Berliner
    - Weissbier not always with wheat





# 18<sup>th</sup> century

- Oekonomische Encyklopädie by Krünitz, 1773
- 67% wheat malt, 33% barley malt
- Decoction mash, no boil of wort
- Wort fermented in mash tun
- Used Kottwitzerbier yeast from Kottbus
- Bottled by publicans
- Grist sometimes included oats

# Early 19<sup>th</sup> century

- Style hugely popular in Berlin
- 1834 Poppe's "Die Bierbrauerei auf der höchsten Stufe der jetzigen Vervollkommnung"
- Detailed description of brewing methods
- Some changes since 18<sup>th</sup> century



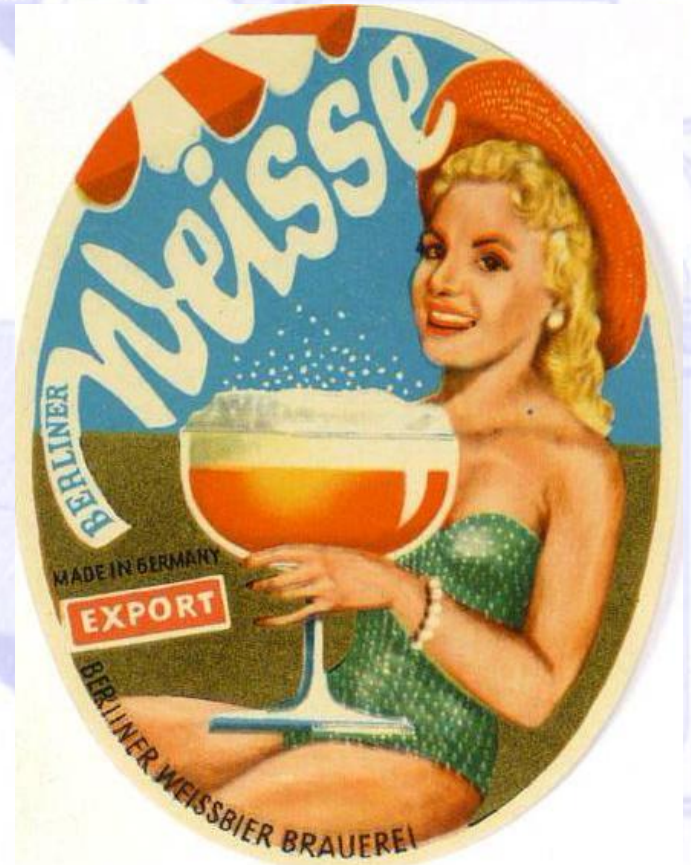


# Weisse according to Poppe

- 67% wheat malt, 33% barley malt
- Hops boiled 15 mins. during a decoction
- Sometimes boiled 45 – 60 mins
- Fermentation in trade casks
- Expelled wort returned to cask
- Vollbier strength: 11 – 12° Plato
- Source: "Die Bierbrauerei auf der höchsten Stufe der jetzigen Vervollkommnung" by Johann Heinrich Moritz Poppe, 1834.

# Mid-19<sup>th</sup> century

- Mixed cultures developed around 1840
- Sold 2-3 days after brewing
- Often watered down at bottling
- Before 1860 smoked wheat malt used
- Wort not boiled





# Late-19<sup>th</sup> century

- Sold in enormous glasses in specialist pubs
- Different strengths:
  - Schankbier (8-10° Plato, 3-3.5% ABV)
  - Vollbier (12° Plato, 5% ABV)
  - Märzen (14° Plato, 5.5% ABV)
  - Starkbier (16° Plato, 6.5% ABV)
- Under pressure from new Lagers





# Berliner Weisse 1850 - 1898

## Berliner Weisse

Year	Brewer	Acidity	OG	FG	ABV	App. Attenuation
1850	Unknown	0.85	1032.5	1015.9	2.13	50.12%
1850	Unknown		1037.8	1022.3	1.98	40.00%
1887	Berliner Actien Brauerei	0.363	1022.6	1019.3	1.18	14.21%
1890	Berliner		1051.1	1013.3	4.89	73.95%
1895	Berliner Export Brauerei		1043.5	1009.8	4.40	76.65%
1895	Berliner G		1039.9	1011.4	3.64	70.60%
1895	Unknown		1040.9	1007.1	4.41	81.97%
1898	Unknown		1038.2	1011	3.52	71.20%

### Sources:

Wahl & Henius, pages 823-830

Brockhaus' konversations-lexikon, Band 2 by F.A. Brockhaus, 1898

"Archive der Pharmacie", 1855, pages 216-217

Handwörterbuch der reinen und angewandten Chemie by Justus Liebig, Johann Christian Poggendorff, Friedrich Wöhler, 1858, page 1038

"Handbuch der chemischen technologie" by Otto Dammer, Rudolf Kaiser, 1896, pages 696-697

# How many Weissbier breweries?

## Number of Weissbier breweries in Berlin 1844 - 1899

1844	12	1875	17 (3)
1849	13	1877	19 (3)
1855	12	1880	25 (3)
1860	13	1885	35 (4)
1865	13	1890	40 (4)
1870	16	1895	34 (4)
1872	17	1899	49 (4)

**Note:** in brackets limited companies

**Source:** "Die Berliner Weisse", by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, page 319.

# Berliner Weisse in 1900

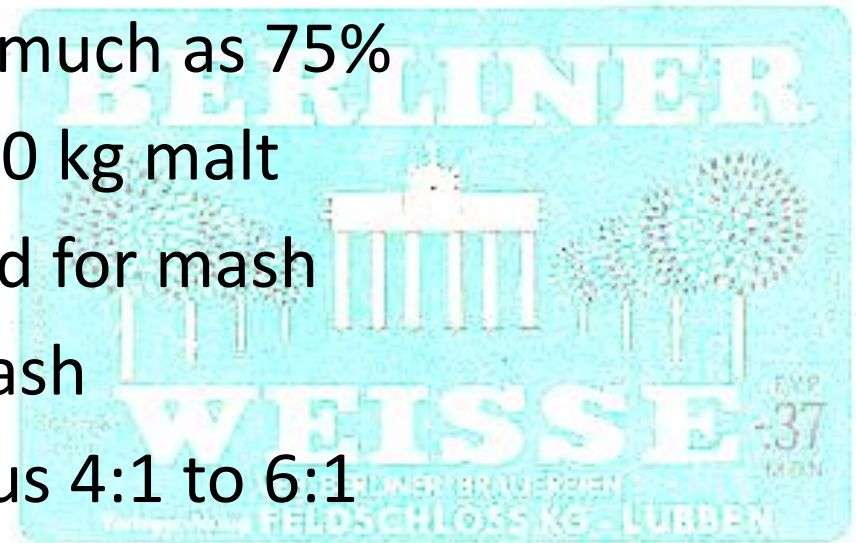
- Weisse still very popular in Berlin
- 1892 47 top-fermenting breweries in Berlin
- 1897 71 top-fermenting breweries
- 33% of beer brewed in Berlin top-fermenting
- 2 largest top-fermenting breweries each produced 150,000 hl annually
- Many Weisse breweries small





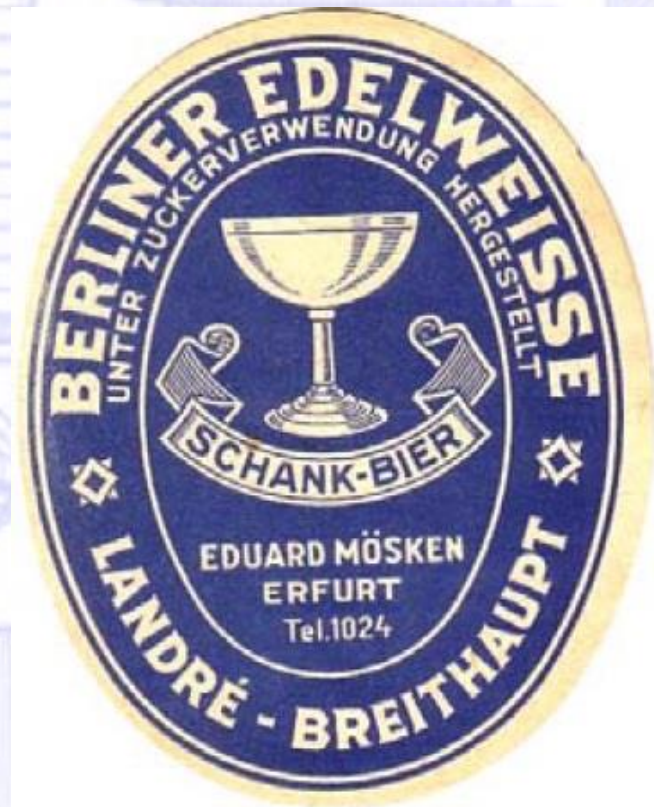
# Berliner Weisse in 1900

- Schönfeld of VLB examined style in detail
  - More wheat in grist – as much as 75%
  - 375 to 500 g hops per 100 kg malt
  - Hops boiled in water used for mash
  - Hops helped filter the mash
  - Ratio yeast to lactobacillus 4:1 to 6:1
  - High degree of attenuation: 66% to 75%



# Berliner Weisse in 1900

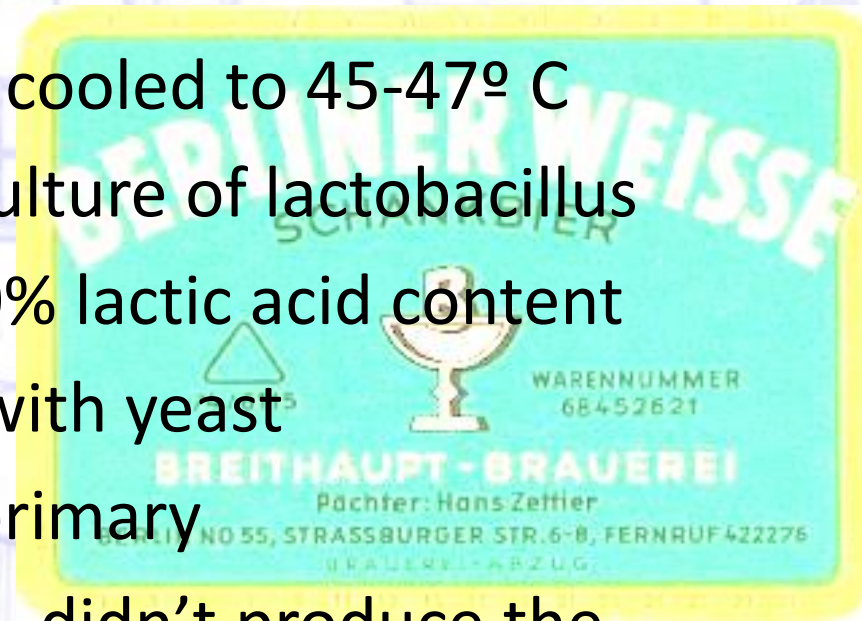
- Kräusened with young beer after primary
- Either bottled by publicans or in brewery
- Stronger: 9-12° Plato
- But 10-35% water often added at bottling
- Adding a Schuss already popular





# 1900 – Francke method

- In 1906 Francke patented a new method
  - Unhopped unboiled wort cooled to 45-47° C
  - Inoculated with a pure culture of lactobacillus
  - After 5-7 hours has a 0.20% lactic acid content
  - Then boiled and pitched with yeast
  - Bottle conditioned after primary
  - Abandoned after 2 years – didn't produce the right flavour because no Brettanomyces





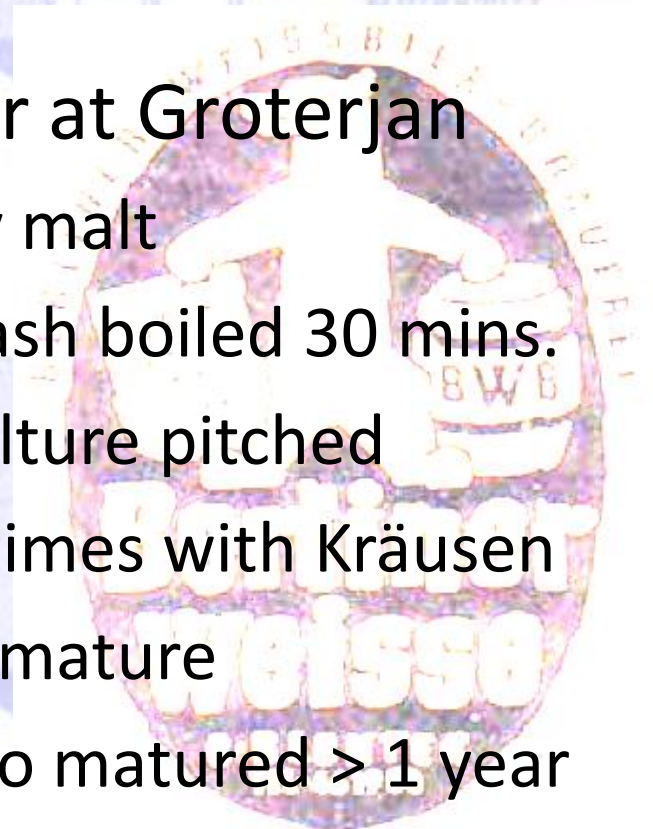
# American Weissbier

- Quite popular in the USA pre-Prohibition
- Brewed the berlin way
- 3.25% ABV
- Lightly-hopped < 0.5 lb per US barrel
- Contained large amounts of lactic acid
- Still brewed after Prohibition



# The 1930's

- Described by Dörfel, brewer at Groterjan
  - 67% wheat malt, 33% barley malt
  - Single decoction, third of mash boiled 30 mins.
  - Mixed yeast/lactobacillus culture pitched
  - Bottled after primary, sometimes with Kräusen
  - Left for weeks or months to mature
  - Stronger version 16-18° Plato matured > 1 year





# 1950's - DDR

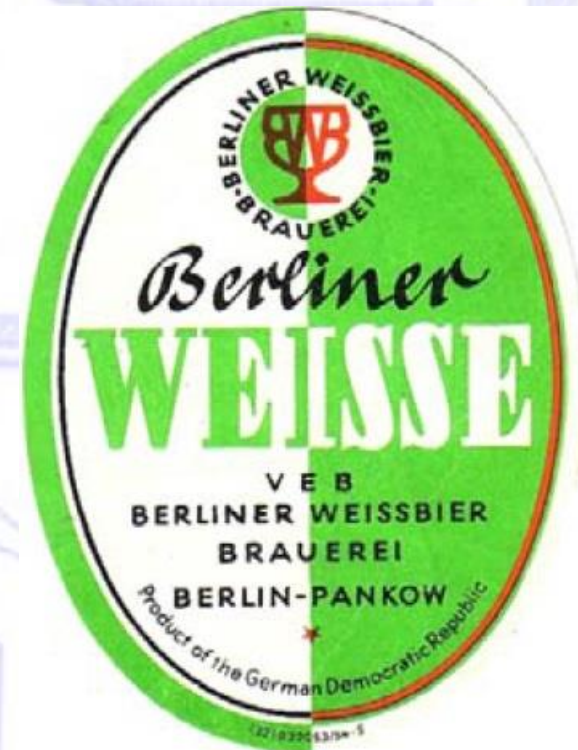
- "Leitfaden für den Brauer und Mälzer" by Rudolf Dickscheit
  - Ratio wheat to barley from 1:1 to 4:1
  - Usually 8-9° Plato, sometimes 12°
  - Wort usually not boiled
  - Single decoction mash
  - Mixed yeast/lactobacillus culture
  - Multiple lactobacillus strains





# 1950's - DDR

- Primary finished in 40 – 48 hours
- 15% Kräusen added at end of primary
- 2 to 3% ABV and 0.25% lactic acid
- Some delivered in barrels & bottled in pubs
- Some bottled at brewery and lagered at 15° C
- Never pasteurised – ruined the flavour



# 1970's West Berlin

- 1978/9 Dietz studied methods of 3 W. Berlin Weissbier breweries
- All brewed differently
- Only 1 used wheat
- 2 used infusion mash, other single decoction
- All added hops at different points
- 2 used mixed culture, 1 fermented separately



# 1970's West Berlin

## Brewery I

Characteristic	Description
Grist	barley malt and wheat malt
Mashing method	infusion
Bittering	75 g leaf hops per 10 hl wort, hops added in the mash
Wort boiling	No boiling of the wort.
micro organisms	VLB - mixed culture of top-fermenting yeast and lactobacillus (multiple strains)
Pitching	Whole wort, 0.1 l yeast/hl
pitching temperature	Ca. 18 °C
primary fermentation	At 18 °C in an open fermenter
Maturation	1st stage lager tank for acid development, 2nd stage in bottle with the addition of fresh beer
Bottle conditioning	4 - 6 weeks at 15 - 20 °C
Requirements for bottle aging	0.6 - 0.7 % CO <sub>2</sub>

**Source:** Die Berliner Weisse, by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, pages 98 - 99.



# 1970's West Berlin

## Brewery II

Characteristic	Description
Grist	100 % barley malt
Mashing method	single decoction
Bittering	63 g hop extract (25 % a-acid) per 10 hl wort, hops added to the Lauter wort
Wort boiling	Bolied 5 minutes with the Lauter wort
micro organisms	VLB - mixed culture of top-fermenting yeast and lactobacillus (multiple strains)
Pitching	Whole wort, 0.5 l yeast/hl
pitching temperature	Ca. 20 °C
primary fermentation	Without cooling at 20 - 25 °C 2 - 4 days in an open fermenter
Maturation	Transfer to the lager tank with 2 - 4% remaining extract for acid development. Before bottling mixed with fresh beer, bottled with 33% Kräusen and remaining extract 1.8 - 2%.
Bottle conditioning	4 - 6 weeks at 20 °C

**Source:** Die Berliner Weisse, by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, pages 98 - 99.

# 1970's West Berlin

## Brewery III (Kindl)

Characteristic	Description
Grist	100 % barley malt
Mashing method	Infusion
Bittering	50 % of the wort is boiled with hops, cooled and pitched with top-fermenting yeast 50 % of the wort is pitched with lactobacillus without the addition of hops and without boiling.
micro organisms	Top-fermenting yeast and a lactobacillus strain, separated and pitched as pure cultures.
Pitching	Fermentation: 50% of the wort at 20° C in a conical; Souring: 50 % of the wort at 45 - 47°C in a conical
primary fermentation	Fermentation at 20 - 22 °C; Souring at 45 - 47 °C ca. 2 days until pH 2.9 - 3.1, acid = 6 - 6.5%
Maturation	Depending on quantity of lactic acid produced, the yeast fermented and bacteria fermented wort are mixed 50 : 50 or 60 : 40. One week lagering under pressure at 15° C to ferment extract.
Bottle conditioning	No bottle conditioning. Roughly filtered (almost clear) and carbonated. No development in the bottle.

**Source:** Die Berliner Weisse, by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, pages 98 - 99.

# 1970's West Berlin

- None of the methods matches the BJCP:
  - “Wheat malt content is typically 50% of the grist (as with all German wheat beers) with the remainder being Pilsner malt. A symbiotic fermentation with top-fermenting yeast and *Lactobacillus delbruckii* provides the sharp sourness, which may be enhanced by blending of beers of different ages during fermentation and by extended cool aging. Hop bitterness is extremely low. A single decoction mash with mash hopping is traditional.”



# 1970's West Berlin

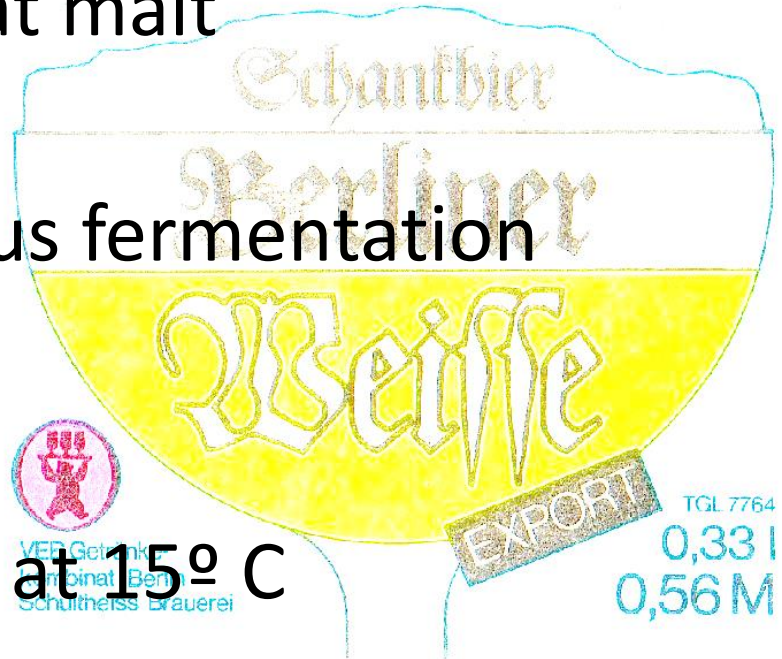
## Analysis after 3 - 12 months of storage

Characteristic	Brewery I	Brewery II	Brewery III
Original gravity	7.22 - 8.06%	7.52 - 7.65%	7.42%
ABW	2.83 - 3.28%	2.60 - 2.80%	2.32%
Real extract	1.24 - 1.59%	1.96 - 2.21 %	2.80%
pH	3.36 - 3.55	3.45 - 3.79	3.28
carbohydrates	0.23 - 0.41 g/100 ml	0.46 - 0.50 g/100 ml	1.56 g/100 ml
acetic acid	0.21 - 0.58 g/l	0.43 - 0.65 g/l	0.09 g/l
D/L- lactic acid	1.28 - 2.39 g/l	0.98 - 1.72 g/l	2.10 g/l
Bitterness	4.7 - 6.5	5.0 - 9.0	3.4

**Source:** Die Berliner Weisse, by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, page 99. (My translation.)

# 1970's East Berlin

- Grist minimum 30% wheat malt
- OG 9° Plato, pH 3.3-3.7
- Mixed yeast & lactobacillus fermentation
- Pitched at 20° C
- Primary lasts 30-48 hours
- Could be lagered in tanks at 15° C
- Bottled with 15% Kräusen
- lactic acid content 0.25-0.35%, no acetic acid



# Brewery numbers decline

## Number of Weissbier breweries in Berlin 1905 - 1970

1905	51 (4)	1920	9 (2)
1909	39 (5)	1924	12 (3)
1912	38 (4)	1928	14 (2)
1914	25 (2)	1933	14 (2)
1916	23 (2)	1940	10 (1)
1918	11 (2)	1978	4

**Note:** in brackets limited companies

**Source:** "Die Berliner Weisse", by Gerolf Annemüller, Hans-J. Manger and Peter Lietz, 2008, page 319.



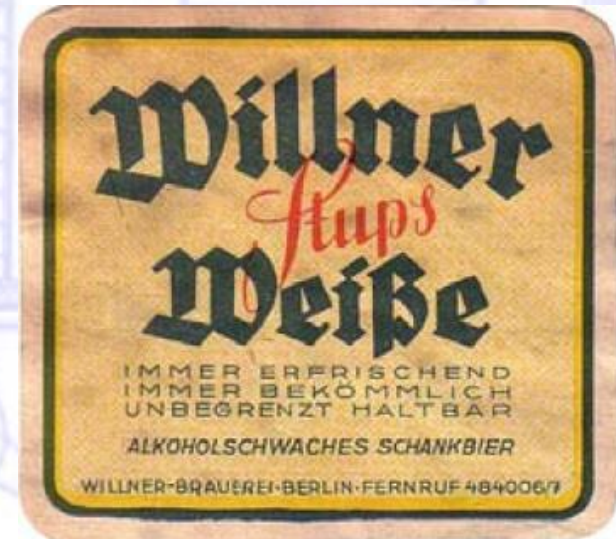
# 1980's

- By mid-1980's 3 breweries left:
  - 2 in West, 1 in East
  - Schultheiss & Kindl in West
  - Schultheiss in East
- 1990 Kindl bought East Schultheiss
- Best version disappeared.



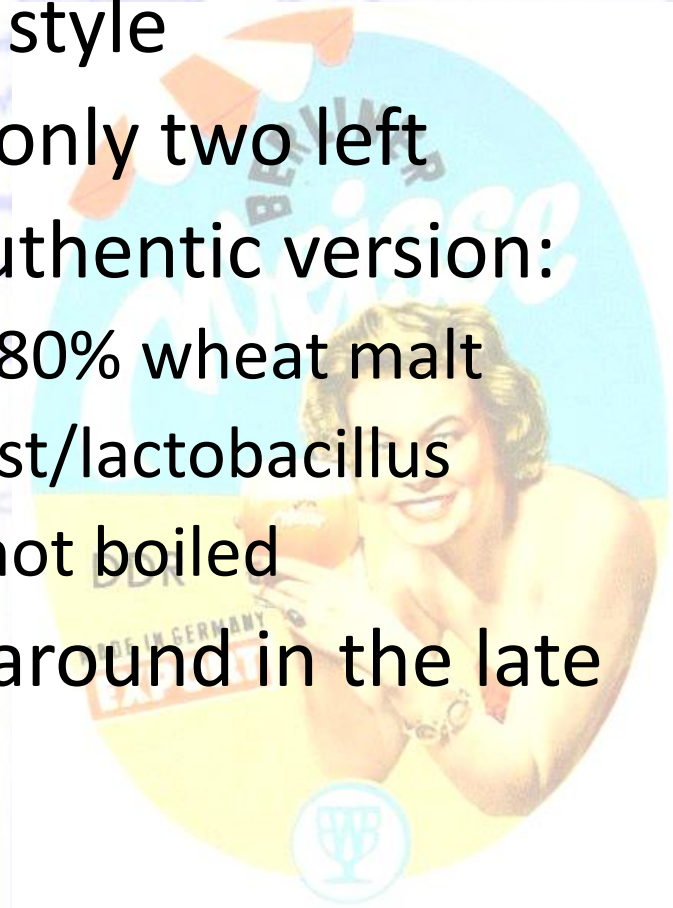
# 1980's – new discoveries

- Frank-Jürgen Methner studied microbiology of Weisse
- Discovered *Brettanomyces bruxellensis* vital to bottle conditioning
- Why wasn't this spotted before?
- Many had studied Weisse in great detail
- Attenuation a clue



# Berliner Weisse today

- Best-known German sour style
- Almost extinct in Berlin – only two left
- Andreas Bogk brews an authentic version:
  - 8° Plato, 2.5 – 3% ABV, 75-80% wheat malt
  - Fermented with mixed yeast/lactobacillus
  - Very lightly hopped, wort not boiled
- Kindl's the worst of the 3 around in the late 1980's





# Questions?

