

(AF)icionado™ Certification Program
(AF)(NA) Beer Certified™ - Exam 1 Syllabus
Updated April 2023

This syllabus is a resource available to anyone seeking additional education and certification on NA/AF beer, and those preparing for the online (AF)(NA) Beer Certification through the (AF)icionado™ Certification Program. This curriculum covers all of the material that is included in the online exam, however additional study outside of this document is required by the candidate in order to obtain all of the knowledge required to understand each subject. The content below contains the foundational information to the (AF)(NA) Beer Certified™ Exam 1 curriculum and exam, and builds into comprehensive knowledge of the subject. For information on other testing regions outside of the United States, please visit alcoholfreeaficionados.com.

Primary authors: Katie Nasiatka, Meagen Anderson, Natalia Fernandez

Secondary authors: Keith Villa, Jodi Villa, Catherine Villa, Jacob Kirkendall

Outline

- 1. Definitions of NA and AF Beer**
 - a. U.S.
 - b. Canada
 - c. Other countries
- 2. History of NA and AF Beer**
 - a. Small beer
 - b. National Prohibition Act
 - c. Light beers
 - d. Low-point beer
 - e. Near beer
 - f. Revival of NA and AF beer
- 3. General Food Safety for NA and AF Beer**
 - a. Why food safety is important
 - b. How NA/AF Beer is Preserved
 - c. Package and storage of NA and AF beer
 - d. Making a food safety plan – where to start your program
- 4. Ingredients and Styles of NA and AF Beer**
 - a. Ingredients
 - b. Styles and commercial examples
 - c. Additional special ingredients
- 5. Production of NA and AF Beer**
 - a. Biological methods
 - i. Modifying fermentation
 - ii. Dilution
 - b. Physical Methods
 - i. Reverse osmosis
 - ii. Vacuum distillation
 - iii. Evaporation
 - c. Adding back flavor – extracts
- 6. Sensory Attributes and Evaluation of NA and AF Beer**

- a. How flavor is perceived in NA and AF Beer: appearance, aroma taste, mouthfeel, finish
 - b. Identify normal flavors of NA and AF beer and their source
 - c. Off-flavor knowledge and their source
- 7. Market, Labeling, and Service of NA and AF Beer**
- a. NA and AF beer market
 - b. Labeling NA and AF beer
 - c. Selling and serving NA and AF beer
- 8. Principles of Mindful Drinking: Marketing & Serving NA & AF Beers**

Learning Objectives

1. Definitions of NA and AF Beer

- Understand differences in alcohol content between NA, AF and Low-alc beer in the US and Canada
- Understand how different countries define NA, AF and Low-alc beer based on ABV (allowable alcohol content limits)

2. History of NA and AF Beer

- Recall basic historical facts of NA and AF beer
- Comprehend the revival of NA and AF Beer

3. General Food Safety for NA and AF Beer

- Describe the characteristic differences between alcoholic and NA/AF beer from a food safety perspective
- Understand the importance as it pertains to NA and AF beer
- Recall best practices for preservation and quality control of NA and AF beer
- Identify best practices for storage of NA and AF beer

4. Ingredients and Styles of NA and AF Beer

- Explain the primary ingredient components of NA and AF beer
- Memorize and recommend commercial examples of NA and AF beer brands and styles
- Understand legal hemp (CBD and Delta-8 THC) as an optional special ingredient in NA and AF beer

5. Production of NA and AF Beer

- Comprehend the major differences between biological and physical/mechanical production methods of NA and AF beer
- General understanding of working definition of each production method for NA and AF beer

6. Sensory Attributes and Evaluation of NA and AF Beer

- Memorize process of evaluating NA and AF beer
- Recall sensory attributes of primary ingredients and process in NA and AF beer
- Understand typical off-flavors in NA and AF beer and their causes and what is unacceptable for service

7. Market, Labeling, and Service of NA and AF Beer

- Comprehend consumer drivers and current state of the NA and AF beer market

- Define the general guidelines at the TTB level in understanding the labeling system
- Understand local state guidelines for service of NA and AF beer vary and state laws should be consulted

8. Principles of Mindful Drinking: Marketing & Serving NA & AF Beers

- Define key concepts behind the mindful drinking movement
- Understand the relationship between human wellness and alcohol consumption
- Memorize the principles of pairing NA and AF beer with food

Full Syllabus

1. Definitions of NA and AF Beer

- a. U.S.
 - i. Alcohol and Tobacco Tax and Trade Bureau (TTB) legally has defined the ABV% for low- or reduced-alcohol beer (less than 2.5%), non-alcoholic beer (less than 0.5%), and alcohol-free beer (less than 0.05%)
- b. Canada
 - i. Non-alcohol (NA) and Alcohol-free beer must be less than 0.5% ABV
- c. Other countries
 - i. Legal definitions of what defines alcohol-free beers varies among countries
 - ii. While NA and AF beer is starting to get popular in the U.S., other countries and regions are leaders in the global market accounting for the rise in NA and AF beers and beverages

2. History of NA and AF Beer

- a. Small beer
 - i. Small beers are low-alcoholic beers, which date back to medieval Europe
- b. National Prohibition Act
 - i. 18th Amendment to the Constitution
 - ii. Prohibited the “manufacture, sale, or transportation of intoxicating liquors”
 1. Prohibition was repealed in 1933
- c. Low-point beer
 - i. Unique to the U.S. known as “three-two beer” or “3 point 2 brew” containing 3.2% alcohol by weight (or ~4.0% ABV)
- d. Near beer
 - i. Originally near beer was a term for malt beverages containing little or no alcohol (less than 0.5% ABV)
 - ii. Today “near beer” refers to both non-alcoholic (NA) beer and alcohol-free (AF) beer
- e. Revival of NA and AF beer

(AF)icionado™ Certification Program

For more information, contact alcoholfreeaficionados.com or cheers@alcoholfreeaficionados.com

3. General Food Safety for NA and AF Beer

- a. Why food safety is important
 - i. Differences between alcoholic beer and NA/AF beer
 1. Innate food safety properties of alcoholic beer (namely the presence of ethanol) is absent entirely or different compared to NA and AF beer products
 - a. An increased food safety risk is why NA and AF beers need to be treated differently compared to their alcoholic counterparts
 2. Foodborne pathogens pose a serious food safety risk, as it has detrimental effects to the human body and some organisms can kill people
 3. Similar to juice and soda, NA and AF beer must be preserved (e.g., pasteurized or otherwise treated)
 - a. Other methods to treat juice and sodas may include food additives (preservatives, natural preservatives), sterile filtering, and/or acidification with food safe acids (e.g., citric acid, sorbic acid, lactic acid)
 - ii. Food safety hazards are categorized as follows:
 1. Biological hazards
 2. Chemical Hazards
 3. Physical Hazards
- b. How NA and AF Beer is Preserved
 - i. Processes and methods to achieve microbial sterility and commercial stability are *highly recommended*
 - ii. Quality Assurance and Control (QAQC) programs allow for producers to validate process methods and ensure products are safe for consumption
 1. Regardless of preservation methods, a QAQC testing program is *highly recommended*
- c. Package and storage of NA and AF beer
 - i. Most NA and AF beers are canned or bottled
 1. Pasteurized NA and AF beers have a recommended shelf-life of about 6 months after the born-on date
 2. Canned NA and AF beer may experience 'bulging' of the can container
 3. Non-preserved or raw (e.g., unpasteurized and *NOT* chemically preserved) NA and AF beer have about a 2 to 6 month shelf-life from brew date and ***must be refrigerated at all times***
 4. Freshness coding of NA and AF beer
 - a. Expiration dates may vary, consult the freshness coding on the package container (can, bottle, keg) or outer packaging (box) of NA/AF beer prior to service
 - ii. There is an increased risk of flavor degradation for draught/on-tap service of NA and AF beer packaged in kegs

1. All kegged NA/AF beer should be treated similarly to canned or bottled products by being closely monitored by QAQC programs during the lifespan of the product
2. Best practices for service of NA/AF draught beer
 - a. Requires cold storage
 - b. Weekly (or more frequent) draught line cleaning
 - c. Dedicated line for NA/AF draught beer is recommended

4. Ingredients and Styles of NA and AF Beer

- a. Ingredients
 - i. Hops – flowers (hop cones) secrete a sticky resinous oil that contains volatile and nonvolatile flavonoids that impart aromas, flavors and other compounds in beverage products
 - ii. Malt – sugars are extracted from the barley during the brewing process
 - iii. Yeast – converts fermentable sugars into ethanol (alcohol)
 - iv. Water – the ingredient used to extract and hydrolyze the solid sugars within the malt grains
 1. Water quality is important
 - a. The pH (acidity and/or alkalinity of a solution) of water is critical
 2. Water quality is also considered by hardness
 - v. Extracts
 1. Can be beneficial in adding back flavors that were lost during production
- b. Styles
 - i. Often produced as a counterpart to recognized category of alcoholic ale or lager style beers
 - ii. Core Styles³²
 1. Pale Ale
 2. Dark Lager
 3. Brown Ale
 4. India Pale Ale
 5. Wheat Beer
 6. Strong Ale
 7. Belgian Style
 8. Hybrid Beer
 9. Porter
 10. Stouts
 11. Bocks
 12. Scottish Style-Ales
 13. Wild and Sour Beers
 14. Pilsners and Pale Lagers
 15. Stouts
 16. Bocks
 17. Specialty Beers

(AF)icionado™ Certification Program

For more information, contact alcoholfreeaficionados.com or cheers@alcoholfreeaficionados.com

- c. Additional/Alternative special ingredients
 - vi. Fruits
 - vii. Cannabis³³
 - 1. CBD
 - a. CBD is one of the two primary cannabis derived cannabinoids
 - b. CBD derived from hemp
 - THC
 - c. Delta-8 tetrahydrocannabinol, or delta-8 THC, is a naturally occurring cannabidiol
 - 2. Brewing with Cannabis: Using THC and CBD in Beer, by Dr. Keith Villa of Ceria
<https://www.brewerspublications.com/products/brewing-with-cannabis>

5. Production of NA and AF Beer

- a. Biological methods - using the inherent biochemical properties of fermentation (e.g., malt, water, yeast, temperature, contact time) to modify the fermentation parameters to achieve ABVs of <0.5%
 - i. Modifying fermentation
 - 1. Arrested fermentation/cold contact – brewer stops fermentation when alcohol production reaches ~0.5% ABV (limit contact time of yeast with wort)
 - ii. Dilution – diluting the final reduced-alcohol beer product with de-aerated water to the desired alcohol content of 0.5% ABV
 - iii. Modified new yeasts – use novel, unique, experimental yeasts capable of producing low alcohol content
- b. Mechanical Methods – the physical removal of alcohol from the finished beer after normal fermentation has been carried out to completion
 - i. Reverse osmosis (RO) – the most common of the membrane filtration methods, dissolved molecules are separated by physically pushing liquid through a thin semi-permeable membrane using high pressures to remove ethanol molecules (and water molecules)
 - ii. Vacuum distillation – (aka., vacuum rectification) is distillation of beer under vacuum conditions taking advantage of the ability to lower the boiling temperature of both ethanol and water
 - iii. Evaporation
- c. Hybrid method
 - i. A combination of two or more of the production methods mentioned above

6. Sensory Attributes and Evaluation of NA and AF Beer

- a. How flavor is perceived in NA and AF Beer: appearance, aroma taste, mouthfeel, finish
 - i. Appearance:
 - 1. Color (SRM) and clarity (haze)

2. BJCP Color (SRM) guide
<https://www.bjcp.org/education-training/education-resources/color-guide/>
3. Haze
4. Foam (head)
- ii. Aroma:
 1. Perceived in orthonasal (sensors in nostrils) and retronasal (perception of flavors and aromas after swallowing and exhaling; sensors located in mouth)
- iii. Taste:
 1. Established Taste:
 - a. Sweet
 - b. Salty
 - c. Sour/Acid
 - d. Bitter
 - e. Umami
- iv. Mouthfeel (body) and finish:
 1. Body
 2. Creaminess
 3. Astringency (tannins)
 4. Finish
- b. Identify normal flavors of NA and AF beer and their source
 - i. Malt and grain flavors
 - ii. Hops
 - iii. Yeast/Fermentation/Process derived flavors:
- c. Off-flavor knowledge and their source
 - i. *Trans-2-nonenal*
 1. Perceived as:
 - *Papery and wet cardboard*
 - ii. Skunky/Light Struck
 1. Perceived as:
 - *Skunk-like or cannabis*
 - iii. Autolysis
 1. Perceived as:
 - *Rubbery or vegetal*
 - iv. Acetaldehyde
 1. Perceived as:
 - *Squash, latex paint, or green apple*
 - v. Butyric acid
 1. Perceived as:
 - *Rancid, baby vomit, or spent grain*
 - vi. Metallic or ferrous sulphate
 1. Perceived as:
 - *Pennies, ink, or blood*
 - vii. Hydrogen sulphide (H₂S)

- 1. Perceived as:
 - *Sulfur or eggy*
- viii. Residual wort flavors and malt sweetness
 - 1. Perceived as:
 - *Potato chips or potato soup*
 - “clean” sweetness
- ix. Grainy/husky
 - 1. Perceived as:
 - *Grainy and husky* combined with and astringent mouthfeel
- x. Isovaleric
 - 1. Perceived as:
 - *Cheesy or blue cheese*
- xi. Dimethyl Sulfide (DMS)
 - 1. Perceived as:
 - *Creamed corn, cooked vegetables, or nutty*

7. Market, Labeling, and Service of NA and AF Beer

- a. NA and AF beer market
 - i. The driver for this market:
 - 1. Younger people (Generation Z, Millennials)
 - ii. Current state of the NA and AF market
 - 1. Low-alcohol, non-alcoholic, and alcohol-free is projected to be one of the fastest growing segments in beer in the U.S.
- b. Labeling NA and AF beer¹⁶
 - i. TTB⁴⁴
 - 1. TTB enforces laws regulating alcohol production, importation, wholesale business, and alcohol labeling and advertising
 - a. Although NA and AF are low to no alcohol content, TTB still enforces regulations especially those actions related to labeling
 - 2. Non-alcoholic and alcohol-free “beer” is not legally defined to be beer
- c. Selling and serving NA and AF beer
 - i. Selling
 - 1. Every state has different laws and regulations for serving NA and AF beer, check your current state and local laws
 - ii. Serving
 - 1. Glassware
 - 2. Freshness
 - 3. NA and AF beer products are best consumed within the recommended “best by or best before” dates

8. Principles of Mindful Drinking: Marketing & Serving NA and AF Beers

- a. Ethanol is present in familiar everyday consumption as a comparable to NA beverage
- b. Health & NA and AF Beverages

- i. Significant improvements in overall health when choosing to abstain from alcohol
- ii. Females & Alcohol
 - 1. Females absorb alcohol at a faster rate than males, and take a longer time to recover
 - 2. Ethanol facilitates the release of histamine in the body.
- iii. Reasons that a customer would choose an NA or AF beverage over an alcoholic beverage
- c. Empowerment & Abstinence
 - i. Support your consumer in the moment that they decide to abstain from alcohol, focusing on the benefits of abstaining, instead of the possible negative outcomes of drinking alcohol
- d. Marketing of NA and AF Beers
 - i. Get feedback from the customers
- e. Suggestions for Marketing NA/AF Beers in Retail Spaces
 - i. Design an NA/AF beer menu, similar to a gluten-free menu, or allergen menu
- f. Mindful Drinking and Food Pairings with NA and AF Beer
 - i. Key NA and AF beer pairing concepts based on Principle of Beer Intensity, concepts from *The Brewmaster's Table* by Garret Oliver and Food and Beer Pairing Principles outlined by Randy Mosher in *Tasting Beer*