NATIONAL OPEN UNIVERSITY OF NIGERIA

HCM 345

Wine and Food Pairing Principles

Module 3

HCM 345 (Wine and Food Pairing Principles) Module 3

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Module 3
Unit 1 Wine and Food Pairing

1.0 Introduction

The combination of food and wine is one of life's great pleasures. It is as old as wine making. The flavour of wine consumed on its own will taste different from when it is consumed with food. Wine and food pairings is an individual choice. Every person's sense of taste is different. In general, each person should decide for him or herself what combinations of wine and food taste good. Pairing wine with food is more complicated than "red with beef and white with fish." Ultimately, a wine should complement the food and cleanse the palate. Food and its accompanying wine should harmonise well together, with each enhancing the others performance.

2.0 Objective

At the end of this unit, you should be able to:

- state the guidelines for pairing wine with food.

3.0 Main Content

3.1Characteristics of Wine and Food Considerations

Table 3.1 shows the characteristics of wine and their food considerations.

Table 3.1: Wine Characteristics and their Food Considerations

Characteristics	Food Considerations
Acidity	This can be used to match or contrast acidity in foods. For example, crisp wine can go well with lemon or tomato.
Age/maturity	The more a wine matures, the more delicate it becomes with complex and intricate flavours. This goes better with grills and roasts. Stronger tasting foods could overpower the wine.
Oak	The more oaked wines go better with more robust and flavoured foods.
Sweetness	It is expected that the wine should taste sweeter than the food so that it does not taste flat or thin with the food. Sweet foods need to be contrasted to blend well with the sweeter wine. For example,acid in foods can harmonise well with sweetness in wine.
Tannin	Tannic wines match well with red meats and semi-hard cheese; but not with egg dishes and salty foods.
Weight	Big rich wines go well with robust/flavoursome meat dishes; but not light –flavoured foods, which they easily overpower.

3.2 Tradition for Matching Wine and Food

Over the years, traditions have developed a how-to- approach to the pairing of wines and foods. Generally, the following traditions apply:

- White wine is best served with white meat, shellfish and fish.
- Red wine is best served with red meat.
- The heavier the food, the more robust the wine should be.
- Champagne can be served throughout the meal.
- Port and red wine go well with cheese.
- Dessert wines best complement desserts and fresh fruits that are not highly acidic.
- When a dish is cooked with wine, it is best served with that wine.
- Regional food is best complemented by wines from the region.
- Wines should never accompany salads with vinegar dressings, chocolate dishes or curries, as the taste will clash or be overpowering.
- Sweet wines should be served with foods that are not too sweet.

3.3 Other Rules in Wine and Food Pairing

The most important rules when it comes to wine and food pairing are:

1. Drink and eat what you like
Choose a wine that you would want to drink, rather than hoping a food match will improve a wine made in a style you do not like. That way, even if the pairing is not perfect, you will still enjoy what you are drinking; at worst, you might need a sip of water or bite of bread between the dish and the glass. The same holds true for the food. After all, if you detest eating liver, there is no wine pairing with it on earth that will work for you.

2. Look for balance
Consider the weight—or body, or richness—of both the food and the wine. The wine and the dish should be equal partners, with neither overwhelming the other. If you balance the two by weight, you raise the odds dramatically that the pairing will succeed. This is the secret behind many classic wine and food matches.

3. Match the wine to the most prominent element in the dish
This is critical to fine-tuning wine pairings. Identify the dominant character; more often, it is the sauce, seasonings or cooking method, rather than the main ingredient. Consider two different chicken dishes: chicken Marsala, with its browned surface and a sauce of dark wine and mushrooms, versus a chicken breast poached in a creamy lemon sauce. The caramelised, earthy flavours of the former tilt it toward a soft, supple red, while the simplicity and citrus flavours of the latter call for a fresh white.

4. Structure and texture matter
Ideally, a wine's components are in balance, but you can affect that balance, negative or positive, with the food pairing. Elements in a dish can accentuate or diminish the acidity and sweetness of a wine, and the bitterness of its tannins.

High levels of acidic ingredients, such as lemon or vinegar, for example, benefit high-acid wines by making them feel softer and rounder in comparison. On the other hand, tart food can turn balanced wines flabby.

Sweetness on the palate can make a dry wine taste sour, but pairs well with a bit of sweetness in the wine; as long as a wine balances its sugar with enough natural acidity (such as German Rieslings and demi-sec Champagnes), it can work very well with many dishes.

Tannins interact with fats, salt and spicy flavours. Rich, fatty dishes such as steak diminish the perception of tannins, making a robust wine such as a Cabernet seem smoother, as do lightly salty foods like Parmigiano-Reggiano cheese. However, very salty foods increase the perception of tannins and can make a red wine seem harsh and astringent; salt likewise accentuates the heat of a high-alcohol wine. Very spicy flavours also tend to react badly with tannins and high alcohol, making the wines feel hotter; such dishes fare better with fruity or lightly sweet wines.

5. Look for flavour links
This is where pairing can be endless fun. The aromatics of wine often remind us of foods such as fruits, herbs, spices and butter. You can create a good match by including ingredients in a dish that echo—and therefore emphasize—the aromas and flavours in a wine. For a Cabernet, for example, currants in a dish may bring out the wine's characteristic dark fruit flavours, while a pinch of sage could highlight hints of herbs.

On the other hand, similar flavours can have a "cancellation effect"—balancing each other out so that other aspects of a wine come out more strongly. Serving earthy mushrooms with an earthy red might end up giving more prominence to the wine's fruit character.

6. Consider age of the wine
Aged wines present a different set of textures and flavours. As a wine matures, the power of youth eventually subsides; the tannins soften, and the wine may become more delicate and graceful. Fresh fruit flavours may give way to earthy and savory notes, as the wine takes on more complex, secondary characteristics. When choosing dishes for older wines, tone down the richness and big flavours and look for simpler fare that allows the nuances to shine through. For example, rather than a grilled, spice-rubbed steak with an older Cabernet, try lamb braised for hours in stock.

Self-Assessment Exercise

i. List the wine characteristics considered in food pairing.
ii. List the rules in wine-and-food pairing.

4.0 Conclusion

The art of wine and food pairing is one, which can bring our experience of both the food and the wine to new levels. There is something almost magical about the interaction of some food and wine, creating a synthesis that is beyond either alone. However, while the right wine and food pairing can increase one's pleasure, matching the wrong food and wine can cause the diminution of either or both.

Wine and food matching is the process of pairing food dishes with wine to enhance the dining experience. Feel free to drink whichever wine you want with whatever food you want, but remember a perfect pairing is a highly enjoyable experience. Always remember also that the goal in food and wine pairing is the enjoyment of the food and wine. You and your guest will be the judge of this experience.

5.0 Summary

In this unit, you have learnt about few important points to bear in mind when thinking about which wine works well with which food. These include the following.

- Keep your guests' tastes in mind - will they enjoy the wine you are considering?
- When pairing wine and food, there are just a few combinations to avoid.
- Watch out for problem foods. Do you need to serve more than one wine to get around this?
- Do not be swayed by the opinions of others. Riesling with beef is fine, if that is what you enjoy.

Wine characteristics considered in food pairing are acidity, age/maturity, sweetness, oak, tannin, and weight.

6.0 Self-Assessment Exercise

Discuss the main considerations in wine and food pairing.

7.0 References/Further Reading

Lillicrap, D. & Cousins, J. (2006). *Food and Beverage Service*. (7th ed.). Hodder Arnold.

Walker, J. R. (2005). *Introduction to Hospitality.* (4th ed).

Unit 2 Sensory Evaluation of Wine

1.0 Introduction

In Unit 1, we discussed wine and food pairing. In this unit, we shall be discussing sensory evaluation of wine. The attributes of a wine rely on the sensory acuity of the winemaker or the winemaker's team. Depending on the winery operations or the style of wine made, the winemaker can be viewed as the expert creating an artisan wine or producing a commercial alcoholic beverage designed to appeal to many consumers. The globalization of the wine market now enables more consumers to taste wines produced in foreign regions. Winemakers producing popular wines have been challenged by evolving consumer needs, values, and motivations for drinking wines, consumption habits, and greater product competition.

Sensory evaluation provides tools to assist winery operations by characterising wine sensory properties thus providing better understanding of consumer preferences and designing better wine styles.

2.0 Objectives

At the end of this unit, you should be able to:

- explain sensory analysis of wine
- state the sensory characteristics of wine
- itemise the challenges of sensory evaluation.

3.0 Main Content

3.1 Sensory Analysis

Sensory analysis or sensory evaluation is a scientific discipline that applies principles of experimental design and statistical analysis to the use of human senses (sight, smell, taste, touch and hearing) for the purposes of evaluating consumer products. The discipline requires panels of human assessors, on whom the products are tested, and recording the responses made by them. By applying statistical techniques to the results, it is possible to make inferences and insights about the products under test. Most large consumer companies have departments dedicated to sensory analysis.

Sensory analysis can mainly be broken down into three sub-sections:

- effective testing (dealing with objective facts about products)
- affective testing (dealing with subjective facts such as preferences)
- perception (the biochemical and psychological aspects of sensation).

Effective testing
This type of testing is concerned with obtaining objective facts about products. This could range from basic discrimination testing (e.g. aretwo or more products differ from each

other?) to descriptive profiling (e.g. what are the characteristics of two or more products?). The type of panel required for this type of testing would normally be a trained panel.

Affective testing
Also known as consumer testing, affective testing is a type of testing concerned with obtaining subjective data, or how well products are likely to be accepted. Usually large (50 or more) panels of untrained personnel are recruited for this type of testing, although smaller focus groups can be utilised to gain insights into products. The range of testing can vary from simple comparative testing (e.g. which do you prefer, A or B?) to structured questioning regarding the magnitude of acceptance of individual characteristics (e.g. please rate the "fruity aroma": dislike|neither|like).

Perception
Perception involves the biochemical and psychological theories relating to human (and animal) sensations. By understanding the mechanisms involved, it may be possible to explain why certain characteristics are preferred over others.

Self-Assessment Exercise

i. What is sensory evaluation?
ii. State the three sub-sections of sensory evaluation.

3.2 Practical Sensory Evaluation Procedures

There are many sensory methods available such asdifference testing, consumer preference and acceptance testing, descriptive analysis, assessment of wine quality using the Australian 3/7/10 system, and estimation of the presence and intensity of off-flavours in wine which arise post-bottling (e.g. cork taint, random oxidation). Performing some of these tests might not be feasible in a small- to medium-sized winery. However, they are offered as a service by other companies if needed.

Difference testing
Difference testing is a way to determine if a sensory difference actually exists between the wine samples. The degree or nature of the difference might not be able to be quantified, yet difference testing is important to determine if different winemaking processing techniques or operations have had an impact on the sensory properties of a wine. For example, difference tests may be performed to determine whether different fermentation conditions or new vineyard treatments alter the character of a wine. This is something particularly important to producers who aim for consistency.

Selection of the appropriate difference test depends on many factors, including the objectives of the test, the number of available tasters and the volume of wine needed for the test.

There are four suitable types of difference tests: triangle, duo-trio, paired comparison and same/different tests. Once a difference has been established, a paired preference test can also be performed.

***Triangle* tests**

These are useful as a multi-purpose difference test to be used throughout the winemaking process when comparing two wines for a difference. The taster is presented with three wines; two are the same and one is different. The taster is required to select the sample, which is different. *Triangle* tests are often preferred as they require fewer tasters to perform the assessment as there is a greater likelihood that a result will be genuine and not due to a chance effect.

***Duo-trio* tests**
These tests are often used instead of a *triangle* test to compare unknown differences between wines. Tasters are presented with a reference wine, and then two test wines; one test wine, which is the same as the reference and the other, is the wine to be tested. Tasters are asked to identify the sample that is the same as the reference wine. This test might be preferred as the taster has a reference wine to compare to, which generally tasters find easier to evaluate. It can also be better for assessing red wines by palate, as there is less taster fatigue. However, more tasters are required to perform the test.

***Paired comparison* tests**
These are tests used when there is a known difference in chemical composition of the wines, which requires a sensory assessment (i.e. a wine is higher in residual sugar, but is it sweeter?) Tasters are presented with two wines and asked to identify which sample is higher in the attribute. This test can be useful when assessing alternative wine blends. The test requires the same amount of wine and tasters as the duo-trio test.

***Same/different* test**
This is similar to the *paired comparison* test. However, it is used when the difference between two wines is unknown. Tasters are asked to identify whether they think the two samples presented are the same or different. These tests are easy to set up, but more tasters are required to perform them. The tasters must perform the test at least twice, receiving a different randomised serving order each time.

Preference test
Once a significant difference has been established between two wines a preference test can be performed. This is useful in situations where winemakers are trying to assess which blend or which yeast fermentation they prefer. It is important to note that a preference test should be performed separately and after a difference test. It may be tempting to combine the two but this should be avoided as results can be misleading. In determining preference, it is also important for the tasters to consider (and possibly discuss) the desired wine style required before tasting the wine. The preference decision should not be a personal preference, but a preference for the wine, which best suits the desired wine style. Preference testing can also be done to establish consumer preference

Descriptive analysis
Descriptive analysis determines the most prominent traits of the wine. It involves trained panels (six-30 people) who evaluate products by rating the intensity of various characteristics on a scale. Statistical analyses are applied to look for differences among various products for characteristics of interest.

Self-Assessment Exercise

i. List the various sensory evaluation procedures.

ii. Mention the four types of difference tests.

3.3 Sensory Tools to Characterise Wine

Sensory evaluation is a scientific discipline used to evoke, measure, analyse, and interpret reactions to stimuli perceived through the senses. Sensory tests are conducted according to protocols minimising physiological and psychological biases that could affect the sensory response of the sensory panel lists. The sensory characteristics of wine are:

- sight/appearance
- odour
- taste

Sight
Sight is the first tool you will use in the wine tasting process. The visual clues that one receives from looking at a glass of wine can be illuminating. One can learn about the probable age, overall condition, as well as the probable "weight" of the wine from merely studying the wine closely. The best possible way to examine wine is over a neutral, preferably white background, lit by natural lighting above.

Odour
Odour is the second and most important tool in the tasting process. The human sense of smell is capable of detecting more than 10,000 different odors, with a "trained" nose capable of recognising more than 1,000 specific aromas. The human sense of smell is also considered the strongest trigger for memories, especially "taste" memories. After examining the wine, the next step is to smell the aroma of the wine, again looking for clues about the wine.

Taste
Taste is the third and last tool in the tasting process. The human sense of taste is based entirely on the taste buds present on the tongue, which are capable of perceiving four basic flavour components: sweet, sour, bitter and salt. While the sensation associated with taste oftentimes seems grander than the four aspects listed, the taste buds are only designed and arrayed to recognise these four simple traits.

The human body provides two pathways to the olfactory epithelium, the organ that senses smell. One is directly through the nostrils. The other is through passageways in the roof of the mouth that lead indirectly into the nasal passage.

Use the taste buds to focus on the following aspects of a wine character.

- The **structure** of a wine is defined by the overall weight/body of the wine combined with the presence of a substance called tannin.
- The **balance** of a wine is defined by the ratio of sweet to sour and whether a wine's base flavour is harmonious with all of its components.
- The **weight/body** of a wine is evident by the fullness, or lack of fullness in the mouth. Wines that seem "heavy" on the palate are illustrating a trait of full-bodied wines.

- The **level of tannin** in a wine is indicated by the presence of "bitterness" on the sides of the tongue. Tannin will give the impression of dryness in the mouth. Suck briefly on a used tea bag and you will know exactly what the sensation of tannin is like.
- For **balance**, look for the sensations of sweet and sour on the tongue. Some grapes have a greater potential for acidity, but that acidity is usually kept in check either by a winemaker's ability to bring out the natural fruit sweetness in the variety, or perhaps by leaving a small amount of residual sugar in the wine. Wines that are too sharp or wines that leave a cloying feeling on the palate illustrate wines that may be out of balance.

Self-Assessment Exercise

List the sensory characteristics of wine.

3.4 Practical Sensory Evaluation Considerations

1. Tasters should taste the wine "blindly"

The identification of the wines to be tasted should not be known to the taster(s). Wines should be presented in a different, randomised order for each taster, with no clues as to their identity. This ensures that the biases of all tasters are minimised, if not eliminated.

2. Have at least two independent tasters

Quality control assessments, such as wine additive taint screening or cork taint checking, require at least two tasters who have strengths in that type of assessment, (e.g. cork taint recognition) to evaluate the wine. If the two tasters do not agree, more rigorous testing might need to be applied.

Knowledge of winemakers and other staff members' sensory strengths and weaknesses is important for this type of testing. Variation among tasters in their ability to perceive different aroma and flavour compounds can be quite large. For example, some wine tasters might have a high threshold for "Brett" flavour compounds, but be very sensitive to cork taint or oxidation.

It is important to note that sensory testing does not have to be limited to winemakers. Any company staff member including administration and cellar door staff can potentially be used for sensory analysis provided they are familiar with the type of test, and their individual strengths and weaknesses have been evaluated. It is therefore, strongly recommended that the cellar floor staff members be trained in sensory evaluation.

This has two benefits: it will increase the number of tasters available for sensory evaluation and make the cellar floor staff members more aware of taints and faults, which is an important skill for people working with your product every day.

3. Repeat the tasting

When performing a difference test a single tasting by each taster might not provide the most accurate information about a wine due to the chance of tasters guessing the correct answer. Having tasters repeat the tasting exercise can decrease this chance of guessing. Difference tests also require a certain number of answers or responses to determine statistical significance and for this, the greater the number of responses the better. An easy way to increase the number of responses without increasing the number of tasters is to have each taster repeat the tasting exercise. This is simple to do as tastings can be organised

so that the same sample comparison is presented twice, with the wines presented in a different order each time.

4. Minimise presentation effects

Fatigue, adaptation, suppression/ masking of flavours and visual biases are all effects that can be decreased with correct presentation of the samples. Ideally, samples should be pre-poured at a constant tasting volume (30mL) and temperature (approx. 20°C), into covered glasses, preferably coded with three digit random numbers. The samples should be presented in a random order, which differs for each taster. Tasters should taste within a set period (e.g. one hour), and if this is not possible, the samples should be re-poured (but not by the taster). This is standard practice in scientific sensory assessments and should be practiced in commercial tastings.

5. Minimise talking during tasting

To prevent tasters influencing the judgement of each other, tasters should not communicate until they have made, and written down, their judgement. To ensure tasters do not communicate during tasting, tasters should taste in isolation, either at different times, i.e. one person goes into the sensory lab as one goes out, or they could taste in different physical areas. If this is not possible, tasters should at least face away from each other and avoid eye contact and talking during the tasting. Use of tasting sheets is also suggested as they make the taster write down a response, and enable tasters to taste and record their results in a standardised format each time. Tasting sheets also enable easy collation of results, and can be filed so there is a record of all tastings.

6. Reduce physiological effects

Fatigue, degree of tiredness, hunger and other issues of emotional state will affect taster performance. Generally, it is recommended to carry out assessments in the morning, with no tasting held for at least half an hour after smoking, eating or drinking. To reduce effects of fatigue and adaptation, ideally a maximum of six to seven wines should be presented at any one session, with tasters having a short rest if more samples are to be assessed.

7. Establish if a difference exists before deciding on preference

Before considering preference testing, establish if there is a significant sensory difference with a difference test. Preferences are an important part of sensory testing and a winemaker will often need to state their preference to aid decision making. Before doing this though, it is essential to ensure that a real difference actually exists between the wines. If there is no sensory difference, or if personnel cannot reliably and repeatedly detect a difference between samples, their preferences are meaningless, and probably due to random choice.

Challenges of sensory evaluation

- Variation among tasters - every taster has strengths and weaknesses
- Assessments based on a personal standard or benchmark
- Bias due to preconceptions when not tasting the wine "blindly"
- The "cellar palate" phenomenon
- Small, insignificant differences may be dwelled upon if the individual is particularly sensitive in that area
- Decisions being influenced by position in company hierarchy and seniority.

3.5 Faults in Wine

A wine fault or defect is an unpleasant characteristic of a wine often resulting from poor winemaking practices or storage conditions, and leading to wine spoilage. Many of the compounds that cause wine faults are already naturally present in wine but at insufficient concentrations to adversely affect it. In fact, depending on perception, these concentrations may impart positive characters to the wine. However, when the concentration of these compounds greatly exceeds the sensory threshold, they replace or obscure the flavours and aromas that the wine should be expressing. Ultimately, the quality of the wine is reduced, making it less appealing and sometimes undrinkable.

There are many causes for the perception in wine faults ranging from poor hygiene at the winery, excessive and/or insufficient exposure of the wine to oxygen, and excessive or insufficient exposure of the wine to sulphur. Other causes include overextended maceration of the wine either pre or post fermentation, faulty fining, filtering and stabilisationof the wine, the use of dirty oak barrels, over extended barrel aging and the use of poor quality corks. Outside of the winery, other factors within the control of the retailer or end user of the wine can contribute to the perception of flaws in the wine. These include poor storage of the wine that exposes it to excessive heat and temperature fluctuations as well as the use of dirty stemware during wine tasting that can introduce materials or aromas to what was previously a clean and fault-free wine.

Self-Assessment Exercise

i. List the challenges of sensory evaluation.
ii. What is wine fault?

4.0 Conclusion

Sensory evaluation is used in the winemaking process to aid decision-making and to evaluate the quality of a wine. To ensure that production decisions are made based on real sensory differences between wines, it is vital to ensure that sensory assessment is performed in a suitable but scientific manner. Sensory assessment should accommodate for the high degree of variability in tasters responses, as one person's perception of a wine will be different from another.

5.0 Summary

In this unit, you have learnt that sensory evaluation of wine involves tasting and testing the different characteristics of the wine. You were exposed to various tests and parameters employed to achieve the evaluation. Considerations and challenges involved in wine sensory evaluation were also considered.

6.0 Self-Assessment Exercise

1. What is sensory evaluation?
2. Discuss the sub-sections of sensory evaluation.
3. Explain the sensory evaluation considerations.
4. Itemise the challenges of sensory evaluation.

7.0 References/Further Reading

Lamar, J. (2001). Sensory User's Manual.

Lesschaeve, I. (2007)."Sensory Evaluation of Wine and Commercial Realities: Review of Current Practices and Perspectives. *Am. J. Enol.Vitic,* 58(2): 252-258.

Wine Business Monthly: A publication for Wineries and Growers (2008).

"Wine Tasting."Wikipedia Free Encyclopedia.

Unit 3 Storage of Wines

1.0 Introduction

In the previous unit, we looked at the sensory evaluation of wine. In this unit, we shall be discussing the storage of wine. Storage is an important consideration for wine that is being kept for long-term aging. While most wine is consumed within 24 hours of purchase, fine wines are often set aside for long-term storage. Wine is one of the few commodities that can improve with age and increase in value. It is therefore important that wine is stored in conducive conditions to avoid deterioration in quality.

2.0 Objectives

At the end of this unit, you shouldbe able to:

- state the factors that affect wines in storage
- enumerate the places to store wine
- discuss bottle orientation in wine storage and length of storage.

3.0 Main Content

3.1Factors Affecting Wine Storage

The factors affecting wine in storage include the following.

Light
Strong, direct sunlight or incandescent light can adversely react with phenolic compounds in wine and create potential wine faults. Delicate, light-bodied white wines run the greatest risk from light exposure, as they are often packaged in darkly tinted wine bottles that offer some protection from the light. Wines packaged in clear, light green and blue coloured bottles are the most vulnerable to light and may need extra precautions for storage. In the cellar, wines are stored in corrugated boxes or wooden crates to protect the wines from direct light.

Humidity
Some degree of humidity is required to keep wines with cork enclosures from drying out. Even when wine bottles are stored on their sides, one side of the cork is still exposed to air. If the cork begins to dry out, it can allow oxygen to enter the bottle, filling the ullage space and possibly causing the wine to spoil or oxidise.

Excessive humidity can also pose the risk of damaging wine labels, which may hinder identification or hurt potential resale value. Some wine experts opine that 75 per cent humidity is ideal for storage. However, there is very little significant research to definitively establish an optimal range.

Concern about humidity is one of the primary reasons why wine experts recommend that wine should not be kept in a refrigerator since the refrigeration process often includes dehumidifying, which can quickly dry out corks.

Some wine experts debate the importance of humidity for proper wine storage. Claims have been made that the relative humidity within a bottle be maintained at 100 per cent regardless of the closure used or the orientation of the bottle. However, some experts hold that low humidity can still be detrimental to premium wine quality due to the risk of the cork drying out. As a way of maintaining optimal humidity, it is recommended that half an inch of gravel be spread on the floor of a wine cellar and periodically sprinkle it with some water.

Temperature

Wine is very susceptible to changes in temperature; hence, temperature control is an important consideration in wine storage. If the wine is exposed to too high a temperature (in excess of 77°F (25°C)) for long periods of time, it may become spoilt or "cooked" and develop off flavours that taste raisiny or stewed.

The exact length of time that a wine is at risk of exposure to high temperatures will vary depending on the wine. For example, some wines such as Madeira is exposed to high temperatures during its winemaking. It is therefore able to sustain exposure to high temperatures more easily than other more delicate wines. If the wine is exposed to too cold temperature, the wine can freeze and expand, causing the cork to be pushed out. This will allow more exposure of the wine to oxygen.

Dramatic temperature swings can also cause adverse chemical reactions in the wine that may lead to a variety of wine faults. Most experts recommend that wine be kept at constant temperatures between 50° and 59°F (10° and 15°C) with 52°F (11°C) being the most ideal temperature for storage and aging.

In general, a wine has a greater potential to develop complexity and a more aromatic bouquet if it is allowed to age slowly in a relatively cool environment. The lower the temperature, the more slowly a wine develops. On the average, the rate of chemical reactions in wine doubles with each 18°F (8°C) increase in temperature. An expert even believes that wine can be exposed to temperatures as high as 120°F (49°C) for a few hours and not be damaged.

Vibration

Although anecdotal information regarding the contributions of vibration in wine storage states that it contributes to the accelerated aging of wine with adverse effects, this remains a research area with relatively little data. In a particular study, vibrations of different frequencies have been shown to have their own distinct effect on the chemistry of the wine though the authors have not stated whether the effects are detrimental to the quality of the wine or if the effects are caused by other aging factors.

3.2 Bottle Orientation during Storage

Most wine racks are designed to allow a wine to be stored on its side. The thinking behind this orientation is that the cork is more likely to stay moist and not dry out if it is kept in constant contact with the wine. Some wineries package their wines upside down in the box for much the same reason.

Research in the late 1990s suggested that the ideal orientation for wine bottles is at a slight angle, rather than completely horizontal. This allows the cork to maintain partial contact

with the wine to stay damp but also keeps the air bubble formed by a wine's ullage at the top rather than in the middle of the bottle if the wine is lying on its side. Keeping the ullage near the top, it has been argued, allows for a slower and more gradual oxidation and maturation process. This is because the pressure of the air bubble that is the ullage space rises and falls depending on temperature fluctuation.

When exposed to higher temperatures, the bubble's pressure increases (becomes positive relative to the air outside of the bottle, and if the wine is tilted at an angle, this compressed gas will diffuse through the cork and not harm the wine. When the temperature falls, the process reverses. If the wine is completely on its side, then, this action will eject some wine through the cork. Through this "breathing" which can result from variations in temperature, oxygen may be repeatedly introduced into the bottle and as a result can react with the wine. An appropriate and constant temperature is therefore preferred. Additionally, oxidation will occur more rapidly at higher temperatures and gases dissolve into liquids faster, the lower the temperature.

While most wines can benefit from lying on their side, Champagne and other sparkling wines tend to age better if they are kept upright. This is because the internal pressure caused by the trapped carbonic gas provides enough humidity and protection from oxygen. A study found that Champagne stored on its side aged more quickly because oxygen was allowed to seep in after the Champagne corks lost their elasticity due to contact with the moist wine.

Self-Assessment Exercise

i. List the factors that affect wine in storage.
ii. Mention the types of wine storage.

3.3 Length of Storage

Wine can be stored for short term or long term.

Short-term storage
Short-term storageis for wine that can be consumed within six months, or bottles that are just from the store and intended to be consumed shortly or bottles that have been pulled from longer storage to be available for spur of the moment consumption.

The closest you can duplicate the conditions necessary for long-term storage, the better. However, small wine racks kept in your kitchen, dining room, pantry or where ever are a satisfactory solution in the short term.

Keep the bottles stored so that:

- store the bottle is on its side so the cork stays moist
- store the wines are at the lowest stable temperature possible
- ensure that the location is free of vibration
- ensure that the location is not a storage area for other items with strong odor

Refrain from placing your rack on top of the refrigerator, close to the light and vibrates from the refrigerator compressor.

Long-term storage
Long-term storageis for wine that one will keep for more than six months before consumption. If one plans to collect fine wines with benefit from bottle maturity (over six months), proper storage is critical. Before choosing a space, be sure it is big enough to house future purchases. In some cases, empty space beneath a stairway is sufficient, or one may find it necessary to allow room for hundreds of wines stored as both individually racked bottles and full cases.

One will need something that is temperature-controlled, humidity, protects from vibration and UV rays. Dark, cool, stable environments work best for wine.

Storing opened wine bottles
Keeping the wine as the winemaker intended overnight is no easy feat, given how rapidly a wine can degrade when exposed to oxygen. The biggest challenge with storing opened wine is the acetic bacteria often present and active in open bottles. Wine does not oxidise in the chemical way, but generally rather more rapidly as the bacteria feed, turning your wine to vinegar.

A typical wine left overnight without any special handling will not be drinkable due to oxidation. On the other hand, a wine that was not fully opened before may well be better in a night to continue evolving. There are four complementary solutions all of which minimise the effect of oxidation on the wine.

- Vacuum corking: Vacuum corking works for the short term, longer if the wine started a little closed in the first place. The problem with this is that while some wines seem to benefit this way, others turn flat and dull.
- Gassing: Laying down a gas blanket works better, but a wine will still react a little with the "neutral" gas or continue interacting with the air mixed in earlier.
- Storage in a smaller bottle: A small bottle, of course, reduces the amount of oxygen in the bottle, but pouring into the smaller bottle is tedious and exposes the wine to more air.
- Refrigeration: Refrigeration is controversial. Some feel that refrigeration "kills" a wine, even white wine. However, when storing opened red wine, it needs to be allowed to warm up before drinking. Place it into the fridge soon after opening.

3.4 Places to Store Wine

Since the end of the 20th century, there has been growth in industries relating to wine storage. Some wine connoisseurs may prefer to store their wine at home in a dedicated room or closet. Other options involve purchases and rentals at off-site wine storage facilities that are specifically designed for the task. Wine can be stored in the following places:

3.4.1 Wine Cellar

A wine cellar is a storage room for wine in bottles or barrels, or more rarely in carboys, amphorae or plastic containers. In an active wine cellar, important factors such as temperature and humidity are maintained by a climate control system. In contrast, passive wine cellars are not climate-controlled, and are usually built underground to reduce temperature swings. An aboveground wine cellar is often called a wine room, while a small wine cellar (less than 500 bottles) is sometimes termed a wine closet.

Active versus passive

Wine cellars can be either active or passively cooled. Active wine cellars are highly insulated and need to be properly constructed. They require specialized wine cellar conditioning and cooling systems to maintain the desired temperature and humidity. In a very dry climate, it may be necessary to actively humidify the air, but in most areas, this is not necessary.

Passive wine cellars must be located in naturally cool and damp areas with minor seasonal and diurnal temperature variations—for example, a basement in a temperate climate. Passive cellars may be less predictable, but cost nothing to operate and are not affected by power outages

Purpose Wine cellars protect alcoholic beverages from potentially harmful external influences, providing darkness and a constant temperature. Wine is a natural, perishable food product. Left exposed to heat, light, vibration or fluctuations in temperature and humidity, all types of wine can spoil. When properly stored, wines not only maintain their quality but many actually improve in aroma, flavour, and complexity as they mature.

3.4.2 Wine Caves

These are subterranean structures for the storage and aging of wine. They are an integral component of the wine industry worldwide. The design and construction of wine caves represents a unique application of underground construction techniques.

The storage of wine underground offers the benefits of energy efficiency and optimum use of limited land area. Wine caves naturally provide both high humidity and cool temperatures; key to the storage and aging of wine.

3.4.3 Wine Accessory

A wine accessory is generally any equipment that may be used in the storing or serving of wine. Wine accessories include many items such as wine glasses, corkscrews, and wine racks.

Wine racks

These are storage devices that hold wine bottles in an orientation facilitating long-term wine aging. Most wine racks are designed for a bottle to be stored on its side, with a slight slant downward towards the bottle's neck. This ensures that wine is always in contact with the cork, preventing the cork from drying out and the subsequent ingress of oxygen, which would ultimately spoil the wine. Wine racks can be made of many materials such as wood, steel, and stone, holding just several bottles to thousands. These racks also serve as decorative pieces in many homes.

Self-Assessment Exercise

i. Name the places wine can be stored.
ii. What are wine accessories?

4.0 Conclusion

No matter how good a wine, or how great it is, maturing potential, if stored incorrectly, will never realise its full potential.

5.0 Summary

Our discussion in this unit centres on ideal wine storage conditions. You have learnt that a relative humidity of around 70 per cent is generally thought to keep corks damp and labels clear of mould. Wines should be stored free from light and vibrations.

6.0 Self-Assessment Exercise

1. Discuss the factors that affect wine in storage.
2. Explain why bottle orientation is important in storage.
3. Describe the places wine can be stored.

7.0 References/Further Reading

D'Agostini, D. (2009). *Into the Earth: A Wine Cave Renaissance*. Panache Partners.

Lichine, A. (1967). *Alexis Lichine's Encyclopedia of Wines and Spirits*. London: Cassell & Company Ltd.

Robinson, J. (Ed.). (2006). *The Oxford Companion to Wine.* (3rd ed.). Oxford University Press.

Unit 4 Spirits

1.0 Introduction

In the previous unit, we discussed the storage of wines. In this unit, we shall be discussing spirits. Alcohol has been used medicinally throughout human history. Its medicinal properties are mentioned 191 times in the Old and New Testaments of the Bible. As early as the turn of the century, there was evidence that moderate consumption of alcohol was associated with a decrease in the risk of heart attack. The evidence of health benefits of moderate consumption has continued to grow over time.

2.0 Objectives

At the end of the unit, you should be able to:

- state the types of spirits
- explain how spirits are produced
- discuss the regulation of spirits
- enumerate the tips for staying healthy with alcohol.

3.0 Main Content

3.1 Definition and Types of Spirit

Spirits are unsweetened, distilled alcoholic beverages intended for human consumption. An alcoholic beverage is a drink containing ethanol, commonly known as alcohol. Spirit drinks possess particular organoleptic qualities and have a minimum alcoholic strength of 15 per centalcohol by volume (ABV). They are produced by the distillation of a fermented base product. Distilling concentrates the alcohol and eliminates some of the congeners. Spirits can be added to wines to create fortified wines, such as port and sherry.

Types of spirits
All spirits are grouped into two broad categories:
- clear spirits
- dark spirits.

All distillates come off the still as clear liquids. The taste, smell, and appearance of the final product depend on how the distiller processes the liquid.

The clear spirits
Clear spirits are the ones that can be seen through. They appear clear. Depending on the foods from which they were distilled, some have a specific flavour. Examples include:

- **Gin** comes in two basic styles. There is the original Dutch *jenevre* (juniper, or *genievre* in French), a distillate of malt spirits that include juniper berries. London dry gin is a clear spirit that is redistilled with juniper berries and further flavoured with aromatic botanicals (plant products).

- **Rum** is distilled from molasses or sugar cane. All rums start out as clear spirits; some are aged in barrels. Aging turns the rum golden, amber, or very dark.
- **Sake** is a clear spirit distilled from rice wine.
- **Tequila** is distilled from the fruit of the blue agave plant. Like rum, all tequilas start out clear, but some turn golden or amber with aging.
- **Vodka** is a true neutral spirit, crystal clear, with no discernible flavour or aroma. Modern vodka producers, however, may flavour their vodkas, changing the taste and sometimes the colour to match the colour of the fruit juice or synthetic flavouring.

The dark spirits

With the exception of brandy, which is distilled from wine, dark spirits are beverages distilled from grains. Like clear spirits, the dark spirits start out clear, but aging in barrels and the addition of colouring agents such as caramel (burnt sugar) to maintain colour consistency from year to year turns them characteristically golden amber. Examples are:

- **Brandy** is a spirit distilled from wine or a mash (fermented mass) of any fruit, most commonly grapes.
- **Whiskey** is a spirit distilled from grain, such as barley, corn, rye, or wheat. A straight whiskey is made from the distillate produced by one operation of a still and added neutral spirits. A blended whiskey contains several straight whiskeys and added neutral spirits.
- **Bourbon** and **Tennessee whisky** are distilled spirits made only in the United States; by law, they must be made of 51 per cent corn.
- **Canadian whisky** is a distilled spirit made in Canada, generally from a mix of grains, primarily corn, plus rye, wheat, and barley.
- **Irish whisky** is a distilled spirit made in Ireland from a mix of grains dominated by barley.
- **Scotch whisky** is a distilled spirit made in Scotland from a mix of grains, primarily barley, plus "small grains"— so-called because they are used in limited amounts. The small grains usually include oats.

Self-Assessment Exercise

i. What are spirits?
ii. List the types of spirits.

3.2 Production of Spirits

All spirits are produced by distillation. In the processing of alcoholic beverages, the distillation is not used as a true purification method but more to transfer all volatiles from the source materials to the distillate. The history of distillation dates back to 2,000 years when it was used in China to make perfumes, and by the Arabs to make spirit-based drinks.

The principle of distillation is that ethyl alcohol vapourises at a lower temperature (78 per cent) than water (100 per cent). Thus, when a liquid containing alcohol is heated in an enclosed environment, the alcohol will form steam first and can be taken off, leaving water and other ingredients behind. This process raises the alcoholic content of the resulting liquid.

There are two main methods of producing spirits:

- pot still method
- patent still method.

The pot still method is used for full, heavy flavoured spirits such as brandy, while the patent still method is used in producing the lighter spirits such as vodka.

Bases for spirits

The spirit drinks are produced from various bases. In each case, the base is a fermented liquid (alcoholic wash). The table below shows some of the bases and the spirits produced from them.

Spirit	**Base**
Whisky, gin and vodka	Barley, maize or rye (i.e. beer)
Brandy	Wine
Calvados	Cider
Rum	Molasses
Tequila	Pulque

Self-Assessment Exercise

i. What is a base?
ii. Name the two methods used in spirits production.

3.3 Regulation of Spirits

The regulation of spirits is under the authority of National Agency for Food and Drug Administration (NAFDAC). It comes under the following headings.

Prohibition:

1. (1) No person shall manufacture, import, export, advertise, sell or distribute spirit drink specified in schedule I to these Regulations in Nigeria unless it has been registered in accordance with the provision of these regulations.

(2) No person shall sell any spirit drink unless the main panel of the label carries a Declaration of the actual percentage by volume of absolute alcohol contained therein.

2. Use and limit

The use and limits of food additives or food colours in the manufacture of spirit shall be as prescribed by the Agency.

3. Restrictions on sale of alcoholic Spirit

No alcoholic spirit with an alcoholic content below 37.0 per cent shall be sold except the label shall bears a declaration of the alcoholic content together with a statement that the product is "under strength."

4. Packaging/labelling
In addition to compliance with the Pre-packaged Food (labelling) Regulations 2004, the following shall apply:

(a) The name of every spirit drink shall indicate the accurate nature.
(b) Where a name has been established for the spirit drink in these Regulations, such a name shall only be used.
(c) Where no common name exists for the spirit drink an appropriate descriptive name shall be used.
(d) A coined or fanciful name may be used, provided, the name is not misleading and is accompanied by an appropriate descriptive term.

5. Advertisement of spirit
In addition to compliance with the Food Products (advertisement) Regulations 2004, the following shall apply:

(a) The content of advertisements of spirit drink shall not be misleading and shall be free of health claims;
(b) Radio, television or print media, advertisements of spirit drink shall not be permitted in children's programmes nor shall children, sportsmen or expectant mothers be used as models;
(c) Gift items promoting spirit drinks shall not be directed at children and sportsmen.

6. Specifications for alcoholic spirit
Alcoholic spirit manufactured, distributed, imported, exported, sold, or advertised in Nigeria shall conform to the specifications provided in Schedule II – V of these regulations.

7. Penalty
(1) Any person who contravenes any of the provisions of these regulations shall be guilty of an offence and liable on conviction in case of:
(a) an individual, to imprisonment for a term not exceeding one year or to a fine of N50,000 or to both imprisonment and fine;
(b) body corporate, to a fine not exceeding N100,000.
(2) Where an offence under these regulations is committed by a body corporate, firm or other association of individuals:
(a) every director, manager, secretary or other similar officer of the body corporate; or
(b) every partner or officer of the firm; or
(c) every trustee of the body concerned; or
(d) every person concerned in the management of the affairs of the association; or
(e) every person who was purporting to act in a capacity referred to in paragraphs (a) to (e) of this regulation is severally guilty of that offence and liable to be proceeded against and punished for that offence in the same manner as if he had himself committed the offence, unless he proves that the act or omission constituting the offence took place without their knowledge, consent or connivance.

8. Forfeiture
In addition to the penalty specified in Regulation 7 of these regulations, a person convicted of an offence under these regulations shall forfeit to NAFDAC the spirit drinks and whatsoever is used in connection with the commission of the offence.

Self-Assessment Exercise

i. What authority regulates sale and consumption of spirits in the country?
ii. Mention the headings under which spirits regulation falls.

3.4 Spirits and Health

The health benefits of moderate alcohol consumption have long been known. One of the earliest scientific studies on the subject was published in the *Journal of the American Medical Association* in 1904.Moderate drinking can be healthy—but not for everyone. One must weigh the benefits and risks.

Alcohol's link with health is two-faced; the face it shows depends largely on who is drinking and how much is being consumed. For most moderate drinkers, alcohol has overall health benefits. While moderate drinking can increase the risk of colon and breast cancer, these risks are trumped by the boost in cardiovascular health—especially in middle age, when heart disease begins to account for an increasingly large share of disease and deaths.

Non-drinkers, however, should not feel the need to start drinking to improve their health. Heavy drinkers, with their increased risk of cancer, heart disease, high blood pressure, cirrhosis, and dependence should cut back or stop drinking altogether. A pregnant woman should also avoid alcohol, since it can cause brain damage to the unborn child.

Another opinion believes that moderate drinkers tend to have better health and live longer than those who are either abstainers or heavy drinkers. In addition to having fewer heart attacks and strokes, moderate consumers of alcoholic beverages (beer, wine and distilled spirits or liquor) are generally less likely to suffer strokes, diabetes, arthritis, enlarged prostate, dementia (including Alzheimer's disease), and several major cancers.

A drink per day is considered moderate drinking for women while for men; it is up to two drinks per day. A general guideline is 12 ounces of beer, five ounces of wine, or 1½ ounces of hard liquor, such as vodka or whiskey.

Alcohol Vs. lifestyle

In alcohol consumption, one may ask, "Why drink to reduce the risk of heart disease? Would eating a balanced diet, exercising, and losing weight not do the same thing? No, it would not. The moderate consumption of alcohol appears to be more effective than most other lifestyle that are used to lower the risk of heart and other diseases. For example, the average person would need to follow a very strict low-fat diet, exercise vigorously on a regular basis, eliminate salt from the diet, lose a substantial amount of weight, and probably begin medication to lower cholesterol by 30 points or blood pressure by 20 points.

However, medical research suggests that alcohol can have a greater impact on heart disease than even these hard-won reductions in cholesterol levels or blood pressure. Only cessation of smoking is more effective. Additionally, other medical research suggests that adding alcohol to a healthful diet is more effective than just following the diet alone.

Longevity

Various studies have been done on the issue of alcohol and health as it relates to longevity. The items below are some of the findings. The emphasis has always been on moderate

consumption. Moderate drinkers tend to live longer than those who either abstain or drink heavily.

- The National Institute on Alcohol Abuse and Alcoholism has found that the lowest death rate from all causes occurs at the level of one to two drinks each day.
- Drinking alcohol in moderation (one to two drinks per day for women and two to four for men) was found to reduce risk of mortality significantly according to meta-analysis of 34 studies of alcohol and total mortality among 1,015,835 men and women around the world.
- An exhaustive review of all major heart disease studies found that "alcohol consumption is related to total mortality in a U-shaped manner, where moderate consumers have a reduced total mortality compared with total non-consumers and heavy consumers.
- A Harvard study found the risk of death from all causes to be 21per cent to 28 per cent lower among men who drank alcohol moderately, compared with abstainers.
- A large-scale study in China found that middle-aged men who drank moderately had a nearly 20 per cent lower overall mortality compared with abstainers.
- Harvard Nurses' Health Study of over 85,000 women found reduced mortality among moderate drinkers.
- A British analysis of 12,000 male physicians found that moderate drinkers had the lowest risk of death from all causes during the 13-year study.
- A large study of about 88,000 people conducted over a period of 10years found that moderate drinkers were about 27 per cent less likely to die during the period than were either abstainers or heavy drinkers. The superior longevity was largely due to a reduction of such diseases as coronary heart disease, cancer, and respiratory diseases.
- A twelve-year long prospective study of over 200,000 men found that subjects who had consumed alcohol in moderation were less likely to die during that period than those who abstained from alcohol.
- A study of more than 40,000 people by the Cancer Research Centre in Honolulu found that "persons with moderate alcohol intake appear to have a significantly lower risk of dying than non-drinkers."
- An analysis of the 89,299 men in the Physicians' Health Study over a period of five and one-half years found that those who drink alcohol in moderation tend to live longer than those who either abstain or drink heavily.
- An Italian study of 1,536 men aged 45-65 found that about two years of life were gained by moderate drinkers (one to four drinks per day) in comparison with occasional and heavy drinkers.
- A study of 2,487 adults aged 70-79 years, who were followed for an average period of over five and one-half years, found that all-cause mortality was significantly lower in light to moderate drinkers than in abstainers or occasional drinkers (those who drank less than one drink per week).
- A large prospective study found that older men consuming up to about three drinks per day and older women consuming over one drink per day had a dramatically lower risk of dying than did non-drinkers.
- A large study found that moderate drinkers, even after controlling for or adjusting for numerous factors, maintain their high longevity or life survival advantage over alcohol abstainers.
- A Danish study of about 12,000 men and women over a period of 20 years found that abstaining from moderate alcohol consumption is a health and longevity risk factor. Choosing not to drink alcohol increases the risk of illness, disease and death.

- A 14-year study of nearly 3,000 residents of an Australian community found that abstainers were twice as likely to enter a nursing home as people who were moderate drinkers. Drinkers also spent less time in hospitals and were less likely to die during the period of the study.
- A prospective study of middle-aged Chinese men found that the consumption of two drinks per day was associated with a 19 per cent reduction in mortality risk. This protective effect was not restricted to a specific type of alcoholic drink.
- Alcohol prevents more deaths than its abuse causes in the United Kingdom, according to research from the London School of Hygiene and Tropical Medicine.
- Scientists at the University of London concluded that light and moderate drinking saves more lives in England and Wales than are lost through the abuse of alcohol. If everyone abstained from alcohol, death rates would be significantly higher.
- The Cancer Council of New South Wales concludes, "If the net effect of total alcohol consumption on Australian society is considered, there is a net saving of lives due to the protective effect of low levels of consumption on cardiovascular disease."

Tips for staying healthy with alcohol

1. If you do not drink, there is no need to start
For some people—especially pregnant women, people recovering from alcohol addiction, people with a family history of alcoholism, people with liver disease, and people taking one or more medications that interact with alcohol—the risks of drinking outweigh the benefits. There are other ways to boost one's heart health and lower risk of diabetes such as:

- getting more active
- staying at a healthy weight
- eating healthy fats and whole grains.

2. If you do drink, drink in moderation; and choose whatever drink you like
Wine, beer, or spirits, all seem to have the same health benefits as long as moderation is the word. Not more than one bottle a day for women and not more than two bottles per day for men.

3. Take a multivitamin with folic acid
Folic acid is the synthetic form of folate, a VitaminB that may help lower the risk of heart disease and cancers of the colon and breast. Those who drink may benefit the most from getting extra folate, since alcohol moderately depletes our body's stores. The amount in a standard multivitamin -400 micrograms- is enough, when combined with a healthy diet.

4. Ask your doctor about your drinking habits
If you or your friends think you may have a problem with drinking, talk to a doctor or other health professional about it. He or she can help.

5. Pick a designated driver
Alcohol and driving do not mix. If you have been out drinking cocktails and it's time to head home, hand your car keys to someone who has been sipping seltzer all night.

Self-Assessment Exercise
List the tips for staying healthy with alcohol.

4.0 Conclusion

Spirits are alcoholic beverages whose sale and use are regulated. They are of various types and are known to have positive health effects when used in moderation. Excessive use of spirits can have damaging effects to health.

5.0 Summary

In this unit, you have learnt that spirits are distilled alcoholic beverages having a minimum alcoholic strength of 15 per cent ABV. You also learnt that spirits are classified as clear or dark spirits. The sale and consumption of spirits is regulated and controlled by NAFDAC. Moderate consumption of alcohol attracts health benefits.

6.0 Self-Assessment Exercise

1. Discuss the two major classes of spirits.
2. Elaborate on the health effects of consumption of spirits.

7.0 References/Further Reading

Blue, A. D. (2004). *The Complete Book of Spirits: A Guide to Their History, Production, and Enjoyment*. New York: Harper Collins Publishers.

Lillicrap, D. & Cousins, J.(2006). *Food and Beverage Service*. (7th ed.). Hodder Arnold.

Unit 5 Liqueurs

1.0 Introduction

In the previous unit, we discussed spirit; in this unit, we shall be discussing liqueurs. Liqueurs are alcoholic beverages. They are historical descendants of herbal medicines; they were made in Italy as early as the 13th century and were often prepared by monks (e.g., Chartreuse and Bénédictine). Nowadays, liqueurs are made worldwide and are served in many ways. Liqueurs are typically quite sweet; they are usually not aged for long but may have resting periods during their production to allow flavours to marry.

2.0 Objectives

At the end of the unit, you should be able to:

- define liqueurs
- enumerate the types of liqueurs
- discuss liqueur production methods
- explain the shelf-life of liqueurs.

3.0 Main Content

3.1 Definition and Types of Liqueur

A liqueur is a sweet alcoholic beverage, often flavoured with fruits, herbs, spices, flowers, seeds, roots, plants, barks, and sometimes cream. The word "liqueur" comes from the Latin word *liquifacere*, which means, "to dissolve." This refers to the dissolving of the flavouring used to make the liqueur.

Liqueurs are not usually aged for long periods, but may have resting periods during their production to allow flavours to marry. Liqueurs are also referred to as cordials.

Liqueurs have sugar contents starting at 2.5 per cent, with the sweetest going far beyond that. Their alcohol content can range from a low 15 per cent (30 proof) to 55 per cent (110 proof). Liqueurs are just as important as the base liquors in the bar, some more than others. These spirits begin with base liquor, which could be anything from a neutral grain alcohol to a brandy, rum or whiskey. To this sugar is added along with a mix of herbs, fruits or spices depending on the desired result. One will often see liqueurs with a main ingredient, such as curacao (orange) or herbsaint (anise), while other liqueurs are more of a blend of flavour, like Campari, Drambuie and Tuaca. Grand Marnier is a delicious example of an orange liqueur, which makes a flavourful ingredient in many recipes.

Cream liqueurs have cream added, while crème liqueurs are much sweeter, likened to potent syrup. Our ancestors referred to liqueurs as *cordials*, and they were often used medicinally.

Types of liqueur

There are many categories of liqueurs as listed below.

Cream liqueur
Cream liqueurs are flavoured mixtures that have been homogenised with cream. They have a rich mixture that is velvety smooth and creamy, and they require no refrigeration. Examples are:

Advocaat (made from a rich blend of egg yolks)
Amarula (sugar, cream, and the fruit of the African marula tree)
Baileys Irish Cream
Baja Rosa
Carolans
Creme de la Creme Maple Cream Liqueur
Cruzan_RumCrea

Coffee liqueur
Café Aztec
Café Britt Coffee Liqueur
Café Oriental
Café Marakesh
CaffèBorghetti
Coloma
Chocolate liqueur
Schnapps liqueur
Brandy liqueur
Anise liqueur
Nut-flavoured liqueur
Herbal liqueur.

Berry liqueur
Chambord (raspberry)
Creme de cassis (blackcurrant)

Crème liqueurs
Are drinks distinguished by being sweet and syrupy.Examplesinclude:
Crème de banane
Crème de cacao
Crème de cassis
Crème de Cerise
Crema di Fragole
Crème de menthe

Flower liqueurs
Bulgarian rose liqueur—from the Valley of the Roses
Crème de Rose (rose)
Crème de violette (violet)
Crème Yvette (violet, vanilla)
Fior d'Alpi (alpine flowers, herbs)
Lavender Liqueur (lavender)

Fruit liqueurs
Amabilli (banana)
AmarulaAfrican liqueur (marula fruit)
Aurum (rum, tea, and tangerines)
Bajtra—Maltese liqueur (prickly pear)
Cherry Heering (cherry)
CosaGialla (citrus fruits)
Cointreau (orange)

Other herbal liqueurs
Agwa de Bolivia (37 Herbs)
Altvater
Amaro
Angelika Bitter (11 herbs, especially Angelica archangelica)
Appenzeller (42 herbs)
Becherovka (anise seeds, cinnamon, and other herbs)
Beirão (seeds and herbs from around the world)
Bénédictine (27 plants and spices)

Honey liqueurs
Bärenjäger
Brandymel
Drambuie
Ron Miel
Tennessee Honey—Jack Daniel's

Nut-flavoured liqueurs
Amaretto (almonds, or the almond-like kernels from apricots, peaches, cherries, or similar stone fruits)
Bellota (acorns)
Dumante (pistachio)
Dwersteg's Organic Amaretto liqueur(organic liqueur with distillate from almond kernels)
Frangelico (hazelnuts and herbs)
Kahana Royale (macadamia nut)
Nocello (walnut and hazelnut)

Whisky liqueurs
Atholl Brose (Scotch whisky, Benromach single malt spirit, honey, secret spice recipe, from Gordon andMacphail)
Bruadar (Scotch whisky, honey, sloe)
Cock o' the North (single malt, blaeberry)
Drambuie (Scotch, heather honey, herbs, and spices)
Eblana (Irish whisky, coffee, honey, almond, peanut)
Famous Grouse liqueur (Scotch, bourbon, citrus, spices)

Other liqueurs
Advocaat (egg yolks and vanilla)
After Shock (several varieties, the most popular of which is cinnamon)
Agnes (orange peels, apples, vanilla and caraway seeds)
Aurum (rum, tea, and tangerines)

Baczewski
Bärenfang (honey),one export version is named Bärenjäger
Bloody Oath (vodka, herbs and spices)
The above listed are examples of variety of brands available in the various categories. The recipes of some of these liqueurs, like Averna, Benedictine, Chartreuse and Frangelico, date back to centuries and are as popular as ever. The distinction between liqueurs and spirits is not simple because many spirits are available today in a flavoured form (e.g., flavoured vodka). The most reliable guide to classification is that liqueurs contain added sugar, but spirits do not.

Liqueurs can also be classified as:

Proprietary liqueurs
These are made exclusively by specific liqueur houses with secret formulas, some of which have been closely guarded for centuries.eg bénédictine, galliano and southern comfort.

Generic liqueurs
Generic liqueurs are made by various producers using fairly standard recipes. Quality brands are typically flavoured with the finest ingredients, essential oils and extracts; less expensive examples often use artificial flavourings e.g. amaretto and crème de cacao

Self-Assessment Exercise

i. What is liqueur?
ii. List the categories of liqueurs.

3.2 Production of Lliqueur

Liqueurs are made by two basic methods:

- heat or infusion method
- coldor maceration method.

Heat or infusion method is used when herbs, peels roots etc. are being used, as heat can extract their oils, flavours and aromas. Cold or maceration method is best suited when soft fruits are used to provide the flavours and aromas. The flavouring of liqueur may be in four ways:

Distillation: Alcohol and flavouring agents are blended before being distilled.
Infusion: Flavourings are steeped in hot water, which is then mixed with the alcohol base.
Maceration: Flavouring agents are steeped directly in the alcohol base.
Percolation: alcohol is dripped through the flavouring agents to extract their essences.

Flavouring ingredients used for liqueur production include:

Aniseed
Apricots
Blackcurrants
Caraway seeds
Cherries
Cinnamon
coriander
kernels of almond
nutmeg
rind of citrus fruit
rose petals
wormwood

The general principle of liqueur making is to take an alcohol base (sometimes called "neutral spirits") and steep a flavouring in it for a time. Next, filter out any remaining solids, add sweetening, and age. Finally, bottle and serve.

3.3 Shelf Life of Liqueurs

Liqueurs and cordials
The shelf lives of liqueurs are more temperamental than the base spirits because they contain sugar and other ingredients, which can spoil, some more than others. Most opened (and well-sealed) liqueurs should last for months and even years depending on their alcohol content and preservatives. Again, opened bottles are likely to lose some of their characteristics due to exposure to air. Once you begin to see any sugar crystallising on the bottom, discolouration, curdling or other changes you will want to throw that bottle away or at least give it a taste test before mixing with it.

Cream liqueurs, those that contain dairy, cream or egg, are a different story and should be discarded after 18 months or so. Liqueurs like Bailey's Irish Cream, Advocaat and Amarula should be consumed within a year of opening, although some of their cheaper creamy cousins will deteriorate faster. Even in unopened bottles, these liqueurs will spoil and be undrinkable after a year and a half or more. Some of these touchier liqueurs will include an expiration date on the bottle as well. It is unnecessary to refrigerate cream liqueurs, but it cannot hurt it

Self-Assessment Exercise
i. Mention two basic methods of liqueur production.
ii. List the ways liqueurs are flavoured.

4.0 Conclusion

Liqueurs were originally used (and some still are) as a digestive. They are now usually served after dinner; they also play an important role in many cocktails. Liqueurs can also be used in cooking, particularly for desserts.

Aging plays a vital role in the production of liqueurs. What goes into the bottle will be harsh and undefined because the various extracts will not have had time to mingle, and some of the delicate aromatics that make the finished liqueur such a pleasure will not be completely developed. Liqueurs are alcoholic beverages, hence health effects and benefits of other alcoholic beverages applies to them.

5.0 Summary

In this unit, you have learnt that:

- liqueurs have sugar content ranging from 2.5 per cent, and an alcoholic content between 15 and 55 per cent.
- liqueurs are made from alcoholic base which could be brandy, whiskey, rum or any other alcoholic wash.

- there are different categories of liqueur and they are produced by two main methods- heat or infusion method and cold or maceration method.
- Different nuts, seeds fruits and other plant parts are used as flavouring agents in the production of liqueurs.

6.0 Self-Assessment Exercise

1. Discuss the types of liqueur.
2. List and explain the categories of liqueur with examples.

7.0 References/Further Reading

Lichine, A. (1987). *Alexis Lichine's New Encyclopedia of Wines & Spirits.* (5th ed.). New York.

Lillicrap, D. & Cousins, J. (2006). *Food and Beverage Service.* (7th ed.). Hodder Arnold.
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