

THE NUTRITIONAL IMPLICATION OF ALCOHOL

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Introduction:

The general use of alcohol for a great variety of social, political, economic, religious and conceptual relationships is evident in the society today. (Odejide, 20007). Alcohol drinking traditionally occurred as a sign of hospitality, functioning as a means of strengthening the bond of friendships and kinship. (Oshodin, 2004). Alcohol is a part of many social occasions, from family dinners to parties, to sporting events, nightcaps, engagements, marriage ceremonies, family and age grade meetings, funeral ceremonies, title taking, festivals and worships. Many people believe that alcohol is food, a necessary nutrient, vitamin, a stimulant, and a poison, a disinfectant necessary for the body to fight against cold, fear, weariness and microbes (Oshodin (1981) Albeit, the truth is that no one needs alcohol to live. Alcohol is not essential in our diets. We consume alcohol to relax, socialize, and celebrate. Alcohol would not fall under the category of an essential nutrient because not having it in our diet does not lead to any sort of deficiency. The calories that come from alcohol are considered "empty calories" because of the lack of other essential nutrients. Alcohol is actually classified as a drug and is a known depressant. Under this category, it is the most widely used drug in the world. Udo (1987) defined alcohol as a colourless, intoxicating and inflammable chemical compound which is obtained commercially by distilling wine or other fermented liquors. Alcoholic beverages contain ethyl alcohol better known as ethanol.

Alcohol production

Alcohol, also known as ethanol, is made through a process called fermentation. During fermentation, yeast breaks sugar down into ethanol and carbon dioxide. This process is Anaerobic, that is, done in the absence of oxygen and once the process is completed, the carbon dioxide gas is released into the air, leaving ethanol and water behind. Distilled spirits, such as vodka, rum, gin, and whiskey, are fermented and then distilled to separate the ethanol from the water. Various sources of sugar are used in these processes, resulting in different forms of alcohol. The sugar from crushed grapes is used to make wine; malted barley is used to make beer; sugar cane or molasses makes rum; grain, potatoes, beets, molasses, and a variety of other plants are used to make vodka.

Types of Alcoholic beverages:

In Nigeria, there are three (3) major types of alcoholic beverages commonly consumed. These include: Beer, Wine and Hard liquor.

Beer:

This is the commonest alcoholic beverage in Nigeria. The brands include Hero, Life, Heineken, Budwiser, Star, Star Rhadler, Guinness stout, Harp, Legend to mention but a few. Beer is produced in the breweries by the fermentation of grains such as Barley, Sorghum, Corn, Millet, Wheat. The starch in these grains is first converted into maltose by malting and then fermented by yeast (*Saccharomyces cerevisiae*). The yeast contains two enzyme, namely, maltase and zymase. The maltase converts maltose to glucose while the zymase converts glucose to ethanol. Some popular beer types in the Nigerian market include: Ale, Lager and Stout. Ale is a type of beer brewed using a warm fermentation method, resulting in a sweet, full-bodied and fruity taste. Historically, the term referred to a drink brewed without hops. As with most beers, ale typically has a bittering agent to balance the malt and act as a preservative. Lager is a type of beer which has been brewed and conditioned at low temperature. Lagers can be pale, amber, or dark. Pale lager is the most widely consumed and commercially available style of beer. Lagers are bottom-fermented. Stout is a dark, top-fermented beer with a number of variations, including dry stout, oatmeal stout, milk stout, and imperial stout.

Wine:

Wine are usually made from grapes. Wine making involves the fermentation of the juice extract from grapes called must. The distinction between red and white wines depends on the presence or absence of anthocyanin pigment in the skins of the grape and also on whether or not these skins are included with the must during the early stages of fermentation. .

Hard Liquor:

The distillation of wine and beer gives rise to hard liquor. In Nigeria, popular and common hard liquor include:

- Brandy distilled from wines
- *Burukutu* distilled from guinea corn
- Local gin (*kai-kai*, *ekpeteshi*, *akpuruachia*) distilled from palm wine
- Oogoro distilled from raffia palm (*Ngwo*)
- Palm wine (*Nkwu enu*, *up-wine*) extracted from palm trees.
- Rum distilled from sugar cane.
- Others include Whisky, Schnapps, Vodka etc. (Onah, 2013).

Alcohol Content of Beverages

Alcohol by volume (abbreviated as ABV, abv, or alc/vol) is a standard measure of how much alcohol (ethanol) is contained in a given volume of an alcoholic beverage (expressed as a volume percent). It is defined as the number of millilitres (mL) of pure ethanol present in 100 mL of solution at 20 °C (68 °F). Alcohol content and percentage can vary widely depending on the drink. That is to say that alcoholic beverage varies in terms of their alcoholic strength, or ability to intoxicate. (Udo, 1987). Different types of alcoholic beverages have their own alcohol by volume (ABV), which means that there are different percentages of alcohol per the volume of liquid. Accordingly, the number of alcoholic beverages one consumes will have a direct effect on the way one's body responds. Understanding ABV is vital to being able to make informed decisions concerning alcohol intake and its possible effects on your health and behavior. Alcohol can cause negative consequences by interfering with the way one's brain operates, making it more difficult to think clearly, make good decisions, and remember information accurately. Making responsible decisions when it comes to alcohol consumption begins by knowing how much alcohol is in a given drink. (NIACC, 2023).

Alcohol Percentage by Drink Type

The main types of alcoholic beverages are beer, wine, and liquor. There are also subcategories within each of these types that may have slightly varying percentages of alcohol. Beer: Alcohol Percentage usually ranges between 4–8%

- Fortified Wine: Alcohol Percentage 16–24%
- Unfortified Wine: Alcohol Percentage 14–16%
- Champagne: Alcohol Percentage 12.5%
- Vodka: Alcohol Percentage 40–95%
- Gin: Alcohol Percentage 36–50%
- Tequila: Alcohol Percentage 50–51%
- Rum: Alcohol Percentage 36–50%
- Whiskey: Alcohol Percentage 36–50%

ABV vs. Proof:

Sometimes one sees both the ABV and “Proof” on the label of a bottle of liquors like vodka. The two measures indicate the percentage of alcohol in the liquid. The proof of the liquor is

exactly double that of the ABV. For example, 80 proof vodka is equal to 40% alcohol, and 110 proof vodka is equal to 55% alcohol. (Alcohol Rehab Guild, 2023).

Alcohol Metabolism

The effects that alcohol has on the health of an individual starts with how it is metabolized. Once alcohol is in the system, the body makes metabolizing of it a priority. This is because unlike protein, carbohydrates, and fat, there is nowhere for alcohol to be stored in our body. Once alcohol is consumed, up to 20% of it can be absorbed in the stomach walls and go directly into your bloodstream. Within minutes, alcohol will reach your brain and give the feeling of being a stimulant. The remaining alcohol goes to the intestines and is absorbed there with the rest of the nutrients. A small amount of alcohol is excreted through sweat, saliva, urine, and your breath, which is how it is detected by a Breath analyzer. The liver is the primary site for alcohol metabolism; this is why one can have liver problems from consuming too much alcohol. Alcohol is detoxified and removed from the blood through a process called oxidation. Oxidation prevents the alcohol from accumulating and destroying cells and organs.

Alcohol and Nutritional Deficiencies

When alcohol replaces foods in a person's diet, the decreased intake of nutrients can cause primary malnutrition. Consuming too little of any of the essential nutrients (protein, carbohydrates, fats, vitamins, and minerals) can lead to deficiencies and health problems. Deficiencies can also occur because alcohol and its metabolism prevent the body from properly absorbing, digesting, and using the essential nutrients in the body.

Effect of Alcohol on Blood Sugar

Blood sugar or blood glucose is utilized by the body for energy. Blood glucose comes from the foods that we eat, the breakdown of the glucose stored in our muscles (glycogen), and it can also be made from other nutrients in the body. The primary hormones involved in maintaining a healthy blood glucose level are insulin and glucagon. Normally, when the blood sugar begins to drop, body responds by making more blood sugar or burning up stored sugar. And when your blood sugar begins to rise, additional insulin is secreted to bring the levels back to a healthy range.

Alcohol is considered a poison by the body, and all efforts are made to excrete it, including the cessation of maintaining healthy blood glucose levels. Studies have shown that alcohol interferes with all three sources of glucose and the hormones needed to maintain healthy

blood glucose levels.. Heavy drinkers deplete their glycogen stores within a few hours when their diet does not provide a sufficient amount of carbohydrates. Over time, excessive alcohol consumption can decrease insulin's effectiveness, resulting in high blood sugar levels. Alcohol can also negatively impact blood sugar levels each time that it is consumed, regardless of the frequency of consumption. Research has shown that acute consumption increases insulin secretion, causing low blood sugar (hypoglycemia), and can also impair the hormonal response that would normally rectify the low blood sugar.. This makes alcohol an even bigger problem for anyone with diabetes. Death due to excessive intake of alcohol has been attributed to block in the oxidation of glucose. (Ama, 1991).

Protein

Protein is made of amino acids. These amino acids help maintain the cell's structure, they transport substances in and out of cells and act as enzymes. Alcohol can interfere with amino acids being absorbed in the small intestines. In the case of chronic liver failure, protein metabolism is greatly altered and numerous complications can occur (decreased albumin, ascites, and increased risk of hepatic encephalopathy). The pancreas is also affected by chronic alcohol exposure,

Fats and Oils

The metabolism of excessive alcohol in the liver may cause liver cirrhosis, alcoholic hepatitis and other liver problems. This altercations impair fat absorption, decrease in fatty acid and glycerol oxidation and increase in the fatty acid synthesis. (Mayoclinic 2023).

Vitamin A

Vitamin A is a fat-soluble vitamin. It is needed for vision (especially night vision), to regulate the immune system, for bone growth, reproduction, and cell division and differentiation. Alcohol has been found to promote a deficiency of vitamin A and also enhance its toxicity when taken in excessive amounts. Supplementation is not an easy thing because alcohol makes it difficult to detect the deficiency accurately. Because vitamin A is toxic in high doses, taking too much in the form of supplements can be dangerous. If this seems complicated, it is. Supplementation could be possible with beta carotene (this is a precursor to vitamin A).

Vitamin B₁ (thiamine)

In the tissues, thiamine is required for the building and functioning of several enzymes. These enzymes are important for the breakdown of sugar molecules into other types of molecules,

the production of certain brain chemicals (for example, neurotransmitters), the production of several other essential molecules, and maintaining the body's ability to defend against free radicals. Alcohol rapidly reduces thiamine levels in people who chronically use it. An unbalanced diet and alcohol's impact on absorption, storage, activation, and excretion of thiamine are thought to be the reasons this occurs. Beriberi is a disease caused by vitamin B1 (thiamine) deficiency. The two major types of beriberi are wet and dry beriberi. Early symptoms of thiamine depletion include weakness, fatigue, and emotional disturbance. As this continues, the deficiency leads to beriberi with cardiac failure, neuropathy, or peripheral edema.

Vitamin B₁₂

Vitamin B₁₂ is needed to help make DNA, maintain healthy nerve cells and red blood cells, and for protein metabolism. Low levels can cause a loss of balance, numbness or tingle in the arms and legs, weakness, fatigue, constipation, confusion, depression, poor memory, soreness of the mouth or tongue, weight loss, and a type of anemia known as megaloblastic anemia. both moderate and heavy alcohol consumption will affect vitamin B₁₂ levels

Calcium

Calcium is known for its role in bone tissue. Its other roles include the contraction and expansion of blood vessel and muscle, the secretion of hormones and enzymes, and transmission of messages through the nervous system. Alcohol consumption can cause a loss of calcium in the body by increasing urinary calcium excretion. Calcium deficiency can also lead to osteoporosis. Alcoholics have been observed to have decreased bone density and osteomalacia (Adult rickets), softening of bones leading to deformation in adults(Jolliffe, 2011). The consumption of excessive alcohol decreases plasma levels of calcium. This is as a result of renal losses or excessive urinary excretion. (Ekeocha, 2012).

Conclusion

In Timothy 5:23, Paul advised Timothy to take a *little* wine for his stomach. This advise is on moderation on the intake of alcoholic beverages. Moderate alcohol use has possible health benefits, but it is not risk-free. For example, even light drinkers (those who have no more than one drink a day) have a tiny, but real, increased risk of some cancers, such as esophageal cancer. And drinking and driving is never a good idea. Moderate alcohol use for healthy adults generally means up to one drink a day for women and up to two drinks a day for men. Moderate alcohol consumption may provide some health benefits, such as: Reducing your risk of developing and dying of heart disease; Possibly reducing your risk of ischemic stroke

(when the arteries to your brain become narrowed or blocked, causing severely reduced blood flow); Possibly reducing your risk of diabetes . However, eating a healthy diet and being physically active have much greater health benefits and have been more extensively studied.

Heavy drinking including binge drinking has no health benefits. Heavy or high-risk drinking is defined as more than three drinks on any day or more than seven drinks a week for women and for men older than age 65, and more than four drinks on any day or more than 14 drinks a week for men age 65 and younger. Binge drinking is defined as four or more drinks within two hours for women and five or more drinks within two hours for men. Excessive drinking can increase your risk of serious health problems, including: Certain cancers, including breast cancer and cancers of the mouth, throat, esophagus and liver; Pancreatitis; Sudden death if you already have cardiovascular disease; Heart muscle damage (alcoholic cardiomyopathy) leading to heart failure; Stroke; High blood pressure; Liver disease; Suicide; Accidental serious injury or death; Brain damage and other problems in an unborn child; Alcohol withdrawal syndrome; hangover, Reduced inhibitions, Slurred speech, Motor impairment, Confusion, Memory problems, Concentration problems, Coma, Breathing problems and even to Death. There is no known safe level for alcohol consumption in pregnant and lactating women.

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