



Alcohol in the Diet; an Appraisal of Its Relation to Illness



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Abstract

Some global conspiracies promoted in all innocence, dupe people into believing unhealthy eating habits. Consequence of these habits is avoidable illness. Among the major conspiracies is the benign nature of alcohol. This appraisal examines the few advantages, and the many disadvantages, of drinking liquor.

Keywords: Alcohol; Cancer; Diet; Drinking; Ethanol

Background

Yeast fermentation of carbohydrates is an ancient method of producing potable alcoholic beverages. The anaerobic metabolism of the yeast *Saccharomyces cerevisiae* includes a whole series of enzymes which break down sugars to yield ethyl alcohol [1]. Much has been written about eating a healthy diet. Intakes in various proportions of fats, carbohydrates, proteins and vitamins with supplemental trace elements, as principles dictating sane eating policies which should lead to a healthy lifestyle with optimal metabolism, action packed activity and illness-free longevity [2-4]. There are some global conspiracies, promoted in all innocence, which dupe many communities into believing unhealthy eating habits are desirable. As with any substance, it's the dose that makes the poison [5]. Many believe if some is good, more is better. The unwanted consequence of this is the development of avoidable illnesses. Among the major conspiracies is drinking alcohol.

Aim

This appraisal examines some of the advantages and disadvantages of alcoholic beverages.

Alcohol

As ethyl alcohol, also known as ethanol, is found in minute quantities in nature. Alcohol consumed by humans is usually diluted. Historically "proof" derives from mixing gun-powder with alcohol and testing to see if the mix will ignite [6]. Pure good alcohol allowed the gunpowder to burn up. In the United Kingdom of Great Britain, Europe and Russia, 57.16% alcohol by volume is considered 100° proof. In the USA and some other countries marketing to the USA, 100° proof is 50% alcohol volume. Accordingly 90° proof in the USA is in reality only 9/10 of 50% of alcohol, or 45% alcohol by

volume. Alcohol above this dilution is deemed too dangerous for human consumption. Euro-alcohol is stronger, and will inebriate drinkers with fewer drinks. Beers, stouts and ales have lower concentrations of alcohol; most are at about 4->6% alcohol by volume. But may be as high as 12%. White wines are usually at 12%, and red wines are more at 12-15%. Champagne is nearly always close to 15-16% alcohol. Desert and aperitif wines like Sherry, Madeira and Port, can be 18 -> 24 %. Spirits and liqueurs vary between 30% (some liqueurs) and 45% (spirits including Vodka, Cognac, Brandy, Armanac, Whiskeys and Slivovitz); very rarely is the alcohol 50% alcohol by volume. Alcohol dilution contents should be stated on the bottle or container label, usually as % alcohol by volume [6,7]. Alcohol metabolizes at the same rate as carbohydrates (1 Gram=4 Cals), but is toxic to many cells, mainly liver and neural cells [8]. Most women and some people have a genetic deficiency to produce alcohol dehydrogenase enzyme, which denatures alcohol into metabolic products. These people are prone to becoming drunk on low intakes of alcohol [10,37].

Discussion

Alcohol

Alcohol, as ethyl-alcohol, or ethanol, is manufactured by yeasts (*Saccharomycetaceae* species, mainly *S. cerevisiae* with anaerobic metabolizing fermenting sources of carbohydrates. Natural sources of mono- and di-saccharides sugars (like glucose, fructose and sucrose from fruits, sugar-cane and beets) as well as polysaccharides (like starches in potatoes, yams and other tubers). Large industries have been developed for the manufacture and distribution of alcohol, and these drinks are marketed as beverages, often with confused messages about promotion of health. Globally

many cultures have been deceived by promoters of alcohol as a health beverage [11]. Moderation is promoted at two drinks per day for women. Three drinks for men each day, with a break of two days abstinence [12]. Bars, brasseries, restaurants, lounges and speak-easies endorse the chronic inebriation. The motive is profit from booze, not health. Resveratrol in red wines has been shown to reduce the prevalence of coronary heart disease. Resveratrol is available in pill form without any alcohol [13]. But alcohol at low blood levels obtained from as low as two drinks per day, does cause slow but inexorable CNS nerve damage. Alcohol is toxic to metabolism [13-19]. Alcohol is notorious as being addictive and alcoholism is as old as recorded history. Alcohol has a direct inhibitory effect on all cognitive abilities including smell, eyesight, neuro-muscular co-ordination, balance, proprioception, hearing and touch [14-17]. Alcohol also damages DNA and is a strong predisposing factor for development of neoplastic changes. Consumers of alcohol have a higher prevalence of cancer formation than those who abstain from alcohol [18-20].

Experimentally, acetaldehyde is a direct metabolite from ethanol, and in hemopoietic stem cells ethanol causes DNA double-stranded breaks. In spite of stimulating recombination repair by p53, damaged chromosomes retain permanent rearrangements [21-36]. The body tries to protect itself against damage caused with alcohol, by using enzymes called aldehyde dehydrogenases (ALDH), that metabolize toxic acetaldehyde into acetate, a benign source of energy. Research shows lacking the critical ALDH enzyme (ALDH2), dilute ethanol results in four times as much DNA damage in cells, compared to cells with fully functioning ALDH2 enzyme [37]. Globally millions of people, many from Southeast Asia, are deficient in the critical ALDH enzyme, (ALDH2) or have faulty versions of them. Accordingly, when they imbibe ethanol blood acetaldehyde increases. Consequent vaso-dilation causes flushing, and drinking small amounts of alcohol results in general nausea. In ALDH-deficient people who are unable to process alcohol effectively, they will have an even higher risk of alcohol related DNA damage, and also a higher rate of induction of carcinogenesis. Alcohol clearance and DNA repair systems are not absolute and alcohol may cause cancer in other ways as well [10,36].

Alcohol is toxic to the liver and a dysfunctional liver is more prone to neoplastic change than a healthy liver [21-24]. Oral cancers are more prevalent in alcohol drinkers than abstainers [24-26]. Smoking more than doubles the risk of cancer for alcohol drinkers [28-30]. That alcohol enhances the taste of drinks is not disputed. Many claim the loosening of inhibition improves the quality of life and makes for a more jovial mood, friendly atmosphere and convivial living. But the same can be achieved without alcohol. Globally many nations have evolved a culture in which alcohol is central, with a multibillion dollar industry supplying a voracious demand which is destructive to society in general, to reducing physical and intellectual vigor, and in general is not needed for healthy living. Bars support a global sophisticated self-deception about refinement and appreciation of tastes inherent in alcoholic products, and this is aggressively encouraged. Huge cash resources

endorse the pleasures for drinking liquor, and promote wine-, and liquor-tastings, but also surreptitiously regular alcohol-drinking under the guise of savoring the taste. Some religions, like Christianity and Judaism, have enshrined the magic of alcohol in wine, into their faith; this derives from anachronistic times when anaerobic fermentation was considered divinely inspired or deified magic. This is among the grandest pieces of misinformation and horrible hoaxes perpetrated on humanity. If the desire is so great for the taste, why are identical tasting, but alcohol-free drinks, not consumed at the same enthusiastic rate as those with alcohol? The reality is that almost every person that imbibes alcohol does so for the neural effects of the alcohol, and not solely for the taste.

Some drinks are marketed as sugar sweetened flavored fruit drinks (Watermelon, peach, strawberry, lemonade or punch agrumes) with alcohol contents as high as 11.9% vol/vol, just 0.1% below the 12% alcohol content which would dictate [by law in Quebec Canada 2008] to call the drink a wine. In North America laws governing alcoholic drinks are determined at State Level, and as a result liquor-control laws vary from state to state... The drinks are marketed in container-cans, some with over half a liter contents, (568ml), and appeals to teen agers. Two cans would be the equivalent of consuming 8 shots of 40% vodka, and has proven to be fatal [36,37]. The alcohol contents of these drinks which are available in Canada are in Table 1 [37]. Two cans renders enough alcohol to induce drunkenness and possible death in young teenagers. FCKD UP was withdrawn from the market after a report of a 14 year old girl died from rapidly drinking two cans, and others may follow [37,38].

Table 1: Alcohol content of flavored drinks available in North America.

Name	% Alcohol Content/vol	Size of Can ml
Captain Morgan Spiked Brew	7%	473ml
Hard Ice XTRA	9%	710ml
Hard Ice Extra Melon D'eau	9%	710ml
X-TRA Tiki Sangria	9%	710ml
Rev-Up	10%	710ml
Four Loko	11.90%	568ml
FCKD Up	11.90%	568ml

Alcohol contents of sugar-fruit flavored drinks

Most are over 500ml. The cans are decorated to increase visual appeal each fitted with easy-to-pull opening rings. The inclusion of caffeine in drinks with ethanol allows for masking the effects of alcohol. This confuses consumers, and excess caffeine as well as ethanol-consumption can lead to serious complications, like cardiac arrhythmias and even death [39].

Some call the alcoholic effect "The Buzz" that it induces. In the 19th Century, when social services were minimal and alcoholism was not well understood as an addiction, there was abuse of alcohol and a strong movement of "tee-totalers" or "The Temperance movement" evolved [31-33]. Alcohol was banned and illegal stills,

shebeens, bars and speak-easies mushroomed. Many unsavory illegal stills had methyl alcohol pollute their product. Methylated alcohol, "Meths" or Wood-alcohol, as it is known, is very poisonous and is often fatal when imbibed [34]. Ethyl alcohol (known as ethanol) was legalized in the 20th Century and subject to consumer constraints (restricting teen-agers from purchasing alcoholic beverages), quality controls and standards of purity, all of which are now enforced by civil laws.

There were an estimated 600,000 new cases of cancers of the head and neck worldwide in 2012 [28] Reducing alcohol drinking in a diet may help to moderate this mortality, but people die from side effects of chronic imbibing when drinking alcohol becomes an addicted habit. In populations who are ALDH-deficient who cannot metabolize alcohol efficiently, have an increase of alcohol related DNA damage, and consequently a higher prevalence of cancer. Alcohol clearance and DNA repair systems are not absolute and alcohol may cause cancer in other ways as well.

"A sin tax "is a state-sponsored tax that is added to products or services that are seen as vices, such as alcohol, tobacco and gambling. These types of taxes are levied by governments to discourage individuals from partaking in such activities without making the use of the products illegal [34]. This has become a 'Cash cow' source of revenue for governments. "In war, politics business and academia, there are no morals, only interests. Touyz 1962" This also seems to apply to people who generate money out of making and marketing booze, as well as to governments who place huge taxes onto the sale of liquor and all alcoholic drinks [33].

Conclusion

Health warnings and damaging doses should be a compulsory disclosure on foods with high risks of morbidity. Moderation is promoted as being desirable, but few people who drink alcohol observe these recommendations. Alcohol addiction, as alcoholism, persists and is acknowledged as a pathological state demanding social, psychological and medical management. Alcoholic's Anonymous (AA) organization helps those who seek help for their alcohol addiction. What can be done to minimize the disadvantages of alcohol consumption? In principle: One drink a day may be regarded as a beverage; a second drink should be considered as abuse.

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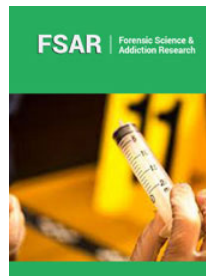
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