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Alcohol and Health

Foreword

Just as education in wines and spirits has become a 'must-have' for those who work in the industry, and a 'nice-to-have' for thousands of interested consumers, so the need for social awareness has become, in our opinion, a 'must-have'.

We live in an age when social responsibility is top of many people's agenda, and as the foremost educational body of its kind in the world, we at WSET believe we should have a stance on the issue of social responsibility.

The Wine & Spirit Education Trust was founded in 1969, when the UK wine industry was starting to gain some serious momentum, and identified the need for high quality education and training for those working in the industry. Now, nearly forty years later, WSET has grown to the extent where we are no longer an exclusively UK-based education provider and awarding body, but have centres in 26 countries, and over 12,000 people annually who take one or more of our qualifications.

We are therefore delighted to support AIM in the production of the Wise Drinkers Guide. It contains information which everyone in the alcoholic beverage industry should read, and for our part we will ensure that all our students have the opportunity to learn more about the social, scientific and medical effects of drinking alcohol.

Ian Harris

Chief Executive

The Wine and Spirit Education Trust

Introduction

The convivial pleasure of enjoying a drink to celebrate, commiserate or unwind forms an integral part of many traditions and cultures, passed down from generation to generation. As such, alcohol has always been recognised as a double edged sword, bringer of pleasure and, historically, a medicine in moderation, but trouble and illness in excess.

This guide hopes to clarify some of the confusion clouding our drinking habits, such as how much is too much? What are sensible drinking guidelines? and is drinking in moderation really good for you?

Moderation Guidelines

It is difficult to lay down strict guidelines as to what constitutes 'moderate consumption' - this will depend on your age, size, sex and health. How and when you consume alcohol are also factors as both the speed of consumption and drinking with food will affect the absorption of alcohol.

Government definitions of a 'drink' or unit vary from country to country, from 8g in Britain to 19.75g in Japan! Moderation, however, is generally medically accepted as between 12-24g of alcohol a day for women and 24-32g for men.

The importance of drinking patterns as well as drinking volumes is underlined by the World Health Organisation who recommend that responsible drinkers should spread the number of units they drink throughout the week, with two alcohol free days a week.

Country	Source	Standard drink in grammes of alcohol	National recommended daily intake in units	Total
USA	Federal Dietary guidelines	12g = 1 unit	2 units for men 1 unit for women	24g 12g
Spain	Ministry of Health	10g (spirits = 17g)	3 units for men 2 units for women	30g 20g
UK	Dept. of Health	8g	3-4 units for men 2-3 units for women	32g 24g

What does sensible drinking mean?

Sensible drinking means drinking enjoyably, sociably and responsibly.

Sensible drinking guidelines are set by governments, so that any potential harm to the human body is minimized and any potential benefit is maximised.

As a parent, it means being aware of the risks to young people of drinking and setting an example of moderation.

Who do the guidelines apply to?

Moderation guidelines do not apply to young people who have not reached physical maturity. People with conditions which may be affected by alcohol, such as high blood pressure, or those taking medications that do not combine well with alcohol should abstain or consult their doctor for advice.

If you drink too much ?

Most people who enjoy drinking find it a sociable and relaxing thing to do. In general drinking sensibly leads to no harm and is compatible with a healthy lifestyle. However, there are times when drinking too much - or even at all can cause problems or harm.

Do not:

- **Exceed the legal BAC limit and drive**
- **Operate machinery, use electrical equipment or work at heights after drinking**
- **Drink heavily before playing sport**
- **Drink while on certain medications - ask your Doctor if you are unsure**
- **Binge drink - it can lead to health and social problems**
- **Drink when pregnant**

Short term increased risks due to getting very drunk include imprudent sex, antisocial behaviour, not getting home safely, vomiting, passing out or even alcoholic poisoning, being a victim of crime and of course, the inevitable hang over. When you 'binge drink' (that is drink five or more units in quick succession on one or two nights a week) you increase your blood pressure and the risk of having a heart attack or stroke.Illnesses related to long term heavy drinking are cancer of the mouth, throat and oesophagus, cirrhosis of the liver, dementia, haemorrhagic stroke and pancreatitis.

It is important to remember that 'the majority of people who drink alcohol, drink sensibly the majority of the time'. Also, more than half the world's adult population choose not to drink alcohol for religious, cultural or health reasons.

With moderate drinking, the risk of developing cardiovascular disease and the risk of death from cardiovascular disease as well as all causes, may be reduced by up to 30%, especially for men over 40 and post menopausal women. The risk increases exceptionally, however, with each drink above moderation. Therefore, while a glass or two of wine, beer or spirits per day can be considered to be 'good for you', drinking 'more' than the guidelines will not provide 'more' benefits, only more harms.

Drinking and driving

The best advice is to nominate a non-drinking driver for the evening, or to arrange a taxi/transport to take you home.

What is BAC?

BAC stands for blood alcohol concentration – that is the amount of alcohol in the blood stream.

A BAC of 0.08 (the UK drink-drive limit) means that an individual has 0.08g of alcohol in their body for every 100ml (0.1L) of blood. Be careful to check drink-drive laws if driving abroad as BAC limits vary from country to country. The USA and UK have a BAC maximum of 0.08g, whereas most of Europe has a limit of 0.05g (in Sweden it is 0.02g).

Men

Taking a standard drink as 10g alcohol, a man's BAC will generally increase by 0.02 for each standard drink. A man's BAC will generally decrease by approximately 1 standard drink an hour. The consumption of alcohol with a meal will significantly slow the absorption of alcohol. The BAC recorded will, therefore, be higher when alcohol is consumed on an empty stomach, but on a full stomach BAC will be recorded for a longer period of time.

Women

A woman's BAC will generally increase by between 0.02 to 0.03 for each standard drink and will decrease by approximately ¾ of a standard drink an hour. These rates are higher than men as women tend to be smaller than men, and they have more fatty tissue per kg body weight than men: drink-for-drink this increases the exposure of organs and tissue to alcohol. Males also have more body water, therefore, alcohol is more concentrated in the body fluids of women consuming the same number of drinks as a male. Finally women possess only half as much of the metabolising enzyme, alcohol dehydrogenase, in their stomachs and liver as men.

Alcohol and Health

Allergy

A food allergy is where a normally harmless substance is perceived as a threat by the body's immune system. In sufferers, even light alcohol consumption can cause an allergic reaction. Allergic reactions include migraine headaches, itchiness, rashes, bowel colic, diarrhoea, asthma, swollen facial features and watery swollen eyes. If you suffer these symptoms on drinking alcohol, consult your doctor.

Many consumers think that the main cause of an adverse reaction to wine is due to sulphur dioxide, which is an antioxidant and preservative. Unless an individual has a similar reaction when eating dried fruits, such as apricots(preserved with much higher levels of S02) this is unlikely.

Hangover?

An adverse reaction or allergy is not to be confused with excessive alcohol consumption. A hangover is where one develops headache, nausea, vomiting, lethargy, and a dry mouth due to excess alcohol consumption. It is due to dehydration especially of the brain cells, which temporarily shrink. The way to prevent a hangover is to drink less alcohol, to pace yourself, to eat when drinking and to drink plenty of water or soft drinks whilst consuming alcohol.

Asthma

If asthma is triggered by sulphur compounds, such as sulphur dioxide (SO2), then fermented beverages should not be consumed as SO2 is used as a preservative and is a natural by product of fermentation. If the asthma is not triggered by sulphur compounds, then alcoholic drinks are unlikely to trigger an asthma attack.

If 'sulphite-sensitive', however drinks that contain a lower concentration of sulphur dioxide are recommended. For example, wines labelled as 'made with organic grapes' contain approximately 50% less sulphur dioxide than bag in box wines.

Is alcohol fattening?

Dry wines, ciders and beers are not only fat free, but almost sugar free too. A standard ½ pint of beer has 90 calories, as does a 125ml glass of dry wine, less than a serving of apple juice. Non-diet premixed spirits are much more calorific per serving.

It is important to include drinking alcohol only as part of a balanced diet and lifestyle, that is plenty of fresh fruit and vegetables and exercise of course.

Energy supplied by various drinks and snacks	Calories
Half pint of 4% ABV Lager	95
125ml 12% AV Wine	96
Half pint 5% Lager	123
Half pint apple juice	133
275ml bottle 5% "alcopop"	179
34.5g packet ready salted crisps	183
100g bar of milk chocolate	525
100g salted peanuts	601

Nutritional Information per 150 ml (5oz) Serving of Table Wine, approx. 12.5 % Alcohol

Key Nutrients	Red Wine	White Wine
Calories	106 kcal	100 kcal
Protein	0 g	0g
Carbohydrates	2.5 g	1.2 g
Fat/Cholesterol	0 g	0 g
Sodium (Na)	7 mg	7 mg
Potassium (K)	164 mg	117 mg
Magnesium	19 mg	14 mg
Calcium	11.4 mg	13 mg
Iron	0 .6 mg	0.5 mg
Vitamin B6	0 .05 mg	0.02 mg
Riboflavin B2	0.05 mg	0.007 mg

Source: USDA National Nutrient Database for Standard Reference, Release 16, 2003. The 2003 USDA database for the Flavonoid Content of Selected Foods also reported significant amounts of anthrocyanidins, flavones, flavonols and flavan-3-ols. Note: Wine also contains yeasts, sulfating agents and sorbates.

Alcohol and the heart

Coronary heart disease is the leading cause of death throughout the developed world, accounting for 25-50% of all deaths. Studies are consistently showing that regularly consuming moderate amounts of alcohol reduces mortality from coronary heart disease by between 25 and 30%.

It is thought that alcohol itself accounts for 75% of the cardio-protective effects of alcoholic beverages. It favourably alters the balance of fats or lipids in the blood, by stimulating the liver to produce the 'good' high density lipoprotein cholesterol (HDL). HDL removes the 'bad' low density lipoprotein cholesterol (LDL) from arteries and veins for disposal via the bile, which is referred to as reverse cholesterol transport.

Alcohol decreases the clotting together or 'stickiness' of red blood cells, which if untreated could form a clot to block blood flow in an artery or vein to cause a heart attack or stroke.

Regular moderate alcohol consumption may reduce the risk of coronary heart disease and stroke mainly in men aged over 40 years and in postmenopausal women, when the risk factors for coronary heart disease and stroke significantly increase.

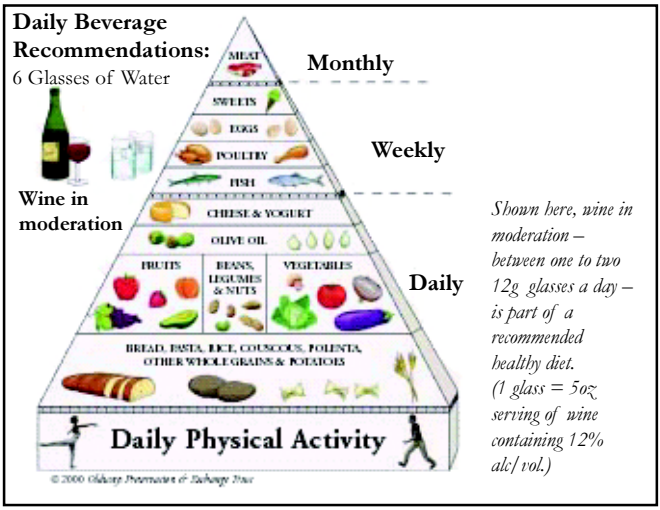
Drinking alcohol is not recommended if you have uncontrolled, high blood pressure. If someone has an existing heart condition, alcohol can generally be drunk in moderation, but only if alcohol use does not affect the medication. A doctor's advice should be sought.

Recent research suggests that one to two 100ml glasses of wine per day for men and one for women does not exacerbate a heart condition. Exceeding this benchmark can significantly increase blood pressure which would, therefore, exacerbate a heart condition.

The Mediterranean diet

Studies have shown that preference of wine is associated with a healthier, 'Mediterranean' diet, higher in fruits, vegetables, fish, salad and olive oil.

This may account for the more favourable health outcomes experienced by wine drinkers. **The Lyon Heart Study** found that this type of diet, combined with moderate wine consumption, might prevent a second heart attack in middle-aged men. Compared to non-drinkers, men drinking two glasses of wine a day reduced their risk of a second heart attack by 59%. It is quite possible that wine drinkers simply have more moderate lifestyles and therefore enjoy better health. Earlier research into the characteristics of drinkers by beverage type has found that wine drinkers are more likely to be non-smokers, well educated, temperate and generally free of symptoms or risk of illness.



Antioxidants

The cardio-protective effects of wine, beers, traditional ciders and cask aged spirits are due to alcohol (approximately 75% of the effects) and the specific phenolic or antioxidant compounds and their polyphenolic forms (approximately 25% of the effects).

Polyphenolic compounds, (anthocyanins or pigment and tannin), give wine its characteristic colour and flavour, and red wine typically has a 200-fold greater concentration of polyphenolic compounds than white wine. Dark beers are richer in antioxidants, complex B vitamins and folic acid than lighter beers too.

Are they the magic ingredients?

Resveratrol and querticin, antioxidants found in wines - are more powerful than the 'benchmark' antioxidants vitamins C and E. Research suggests that the phenolic compounds of wine, which are present in many other alcoholic beverages, appear to:

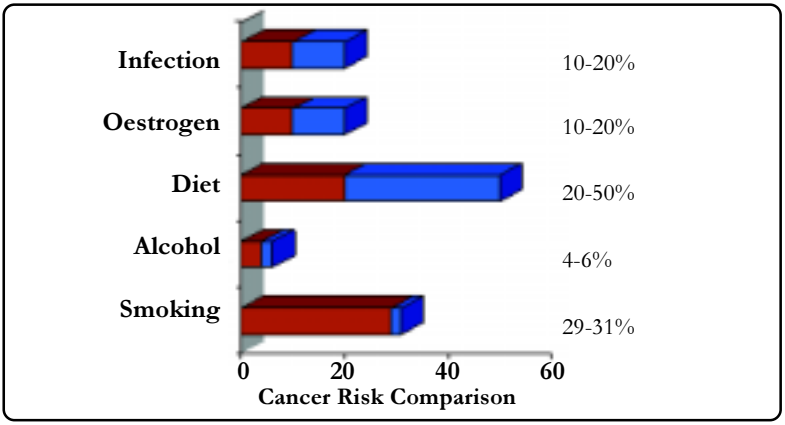
- Decrease the oxidative transformation of 'bad' cholesterol in the body called low-density lipoprotein or 'LDL'-cholesterol. This prevents oxidised LDL- cholesterol from accumulating on blood vessel walls, which if untreated could narrow an artery or vein to eventually block blood flow causing a heart attack or stroke.
- Enable blood vessel walls to relax and dilate from being continually contracted and narrowed. When the blood vessel wall is contracted, blood pressure is increased, but when relaxed blood pressure decreases and this prevents a blood vessel from rupturing to cause a stroke.
- Decrease the clotting together of red cells, which if untreated could form a clot to block flow in an artery or vein to cause a heart attack or stroke.

It should be remembered that drinking alcohol should be for pleasure and enjoyment, rather than for any health benefit.

Alcohol and Cancer

There is no doubt that the prolonged excessive consumption of alcohol, especially when combined with smoking, leads to an increased incidence of many cancers (mouth, throat, larynx, oesophagus and liver).

However, for moderate drinkers, recent research is encouraging:



The American Cancer Society reported findings in 1998 that there was a reduction in cancer mortality rates of 20% amongst those who drank in moderation. At consumption levels above 30g, the risk of cancer increases.

It appears that the anti-cancer capabilities of some alcoholic drinks are due to **antioxidants**, for their best-known function (see separate section).

Breast cancer

Some research shows that there could be an increased risk associated with alcohol use above one drink a day. Individual risk varies according to hereditary genes. We know that there is a sharp increase in breast cancer risk at above 30g alcohol intake a day.

Alcohol and Diabetes

Diabetics can consume alcohol, but preferably with a meal. The consumption of alcohol without a meal can cause blood sugar level to fall unexpectedly (hypoglycaemia), in particular, if on insulin.

If more than a light to moderate amount of alcohol is drunk, alcohol can react with many of the prescribed diabetic medications and worsen the side effects of diabetes such as increased blood pressure.

Recommendations are a maximum of two 10g standard drinks per day for men and one 10g standard drink per day for women. For further information visit www.diabetes.e-medicinehealth.com or www.diabetes.about.com

Which drinks?

Low sugar or 'dry' varieties of wine are recommended for diabetics. These include still and sparkling styles and also dry sherry, but not medium dry/sweet sherry or sweet dessert wines. Beers and spirits (avoid sweet mixers) are fine but high sugar liqueurs and fortified wines should also be avoided.

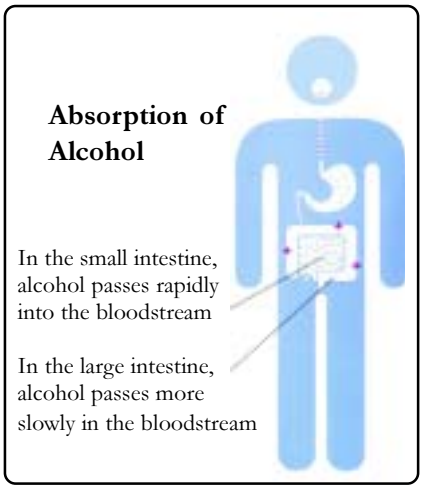
Ethnic differences

Some Asian populations such as the Chinese and Japanese, have a large proportion of individuals with an 'inactive' gene for breaking down alcohol. Acetaldehyde, therefore, accumulates in the blood stream and liver. The blood concentration of acetaldehyde in individuals with the inactive gene can be 10-times higher than normal. The physical effects of having the inactive gene include the following:

- facial flushing – a rapid increase in the blood flow to the skin of the face, neck and chest;
- a rapid heart beat;
- a headache;
- nausea and vomiting;
- extreme drowsiness or tiredness; and
- low blood pressure.

These physical effects can occur after only one standard drink and are so unpleasant that individuals with the inactive gene generally consume little if any alcohol.

Gastro-intestinal Tract

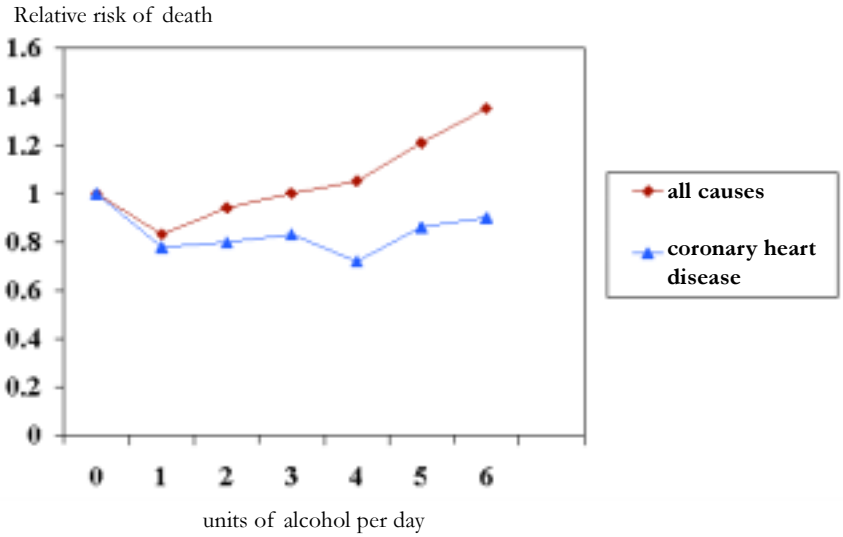


An enzyme in our stomachs, known as alcohol dehydrogenase (ADH), is key in breaking down alcohol. Women's stomachs contain about 60% as much alcohol dehydrogenase as do men, which is why women's daily drinking guidelines are lower than men. Blood alcohol level is related to the rate of drinking, as alcohol is absorbed into the blood stream from the small intestines. The alcohol is then transported in the blood stream to the liver, which breaks down the alcohol. The capacity of the liver to break down alcohol is limited, so that if there is more alcohol in the liver than it has capacity to break down, then the remaining alcohol will circulate in the blood to other organs and tissues of the body, such as the brain. The alcohol will remain circulating until it has all been broken down by the liver (the liver can break down about one unit an hour of alcohol). Alcohol is converted in the liver with the aid of ADH into toxic acetaldehyde, which is then broken down into water and carbon dioxide, substances that are excreted via the natural route!

Absorption of Alcohol

That wine, especially, and other alcohol-containing beverages help prevent gastro-intestinal infections in moderation has been known for a very long time. Claret, drunk in British army messes in India, was held to be "a sovereign preventative against the prevalent cholera". The antioxidants are believed to help prevent infection by Heliobacter pylori, a bacterium that causes chronic gastritis and most ulcers. Wine and spirits may also be an inhibitor of Escherichia coli, Salmonella, and Shigella, causes of "traveller's diarrhoea" and worse, typhoid and related diseases, and bacillary dysentery, respectively.

J-Shaped Curve



Light and moderate drinkers of any form of alcohol live longer than those who abstain or drink heavily. This widely accepted relationship is known as the J-shaped curve. The relative risk of mortality is lowest among moderate consumers (at the lowest point of the J), greater among abstainers (on the left-hand side of the J), and much greater still among heavy drinkers (on the right-hand side of the J). In addition to longevity in general, the J-shaped relationship also exists for cardiovascular deaths,

specifically for coronary heart disease, the leading cause of death in the Western world. For this reason, a great deal of alcohol research has focused on cardiovascular health.

Pregnancy

Drinking and conception

If women drink more than once or twice a week, or more than one or two units each time, it could affect the menstrual cycle and fertility levels.

Men should note that alcohol lowers the sperm count; and heavy drinking can cause temporary impotence.

Drinking when pregnant

If you drink when you're pregnant, alcohol from your blood crosses the placenta and enters the baby's blood.

Heavy drinking during pregnancy can affect the development of the fetus. In the first three months, heavy drinking can damage the developing organs and nervous system. After this, it can have the additional effect of stopping the baby from growing and developing properly.

Fetal Alcohol Syndrome

Fetal Alcohol Syndrome (FAS) is the name given to a set of serious problems in babies whose mothers drank heavily when pregnant. They include facial deformities, poor growth and mental problems.

Breastfeeding

Alcohol clears from a mother's milk at the rate of around one unit every two hours. So it is best to avoid alcohol before breastfeeding, or to plan ahead and express milk if drinking alcohol later.

A Spirited Old Age?

The UK Government guidelines explain that middle aged or elderly non-drinkers or infrequent drinkers and especially those at risk for heart disease **"may wish to consider the possibility that light drinking may be of benefit to their overall health and life expectancy."**

As well as the 'heart-healthy' benefits of moderate drinking to older people, research is also finding that moderate alcohol consumption may reduce the risk of dementia and Alzheimer's disease. At the World Alzheimer's Congress held in July 2000, it was reported that one or two alcoholic drinks/day reduces the risk of the disease significantly.

Heavy alcohol consumption will, however, cause neural damage and memory loss.

Vegetarians and Vegans

The class of vegetarian will determine whether alcohol can be drunk. Wine may have been clarified with egg albumin (egg protein), casein (milk protein), gelatin (beef) or isinglass (fish), which are all compounds derived from animals. Beer is clarified with isinglass. Essentially all of the clarifying agent is removed prior to bottling and hence does not remain in the finished product.

Yeast Allergy

Generally most drinks can be drunk without an allergic reaction occurring, because although yeast is used for fermentation of beer, cider and wine, a negligible amount remains in the finished product. A certain concentration of yeast breakdown products will, however, remain in the finished beverage. If an intolerance to yeast is experienced, consumers should avoid wines that are aged 'sur lie', this means aged on the yeast cells for extra complexity or cask conditioned ales.

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