

Note

ALCOHOL AND DRINK DRIVING IN THE UNITED KINGDOM*

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The background to and current status of the drink driving law in the United Kingdom is explained. Screening tests and analytical methods for alcohol in blood, breath and urine are described. Legal limits of 80 mg/100 mL in blood, 107 mg/100 mL in urine and 35 µg/100 mL in breath have been set.

Penalties for exceeding the legal limit include a twelve month ban from driving for a first offence and three years and ten years respectively for subsequent convictions. Special reasons why a licence should not be withdrawn are considered together with the effect of medication on alcohol levels. Finally, the question of whether legal limits in the United Kingdom are too high is considered together with whether the punishments imposed are too severe.

KEY WORDS: *alcohol analysis, blood alcohol, breath alcohol, effect of medication, ethanol, legal limits, legal penalty*

ALCOHOL

The stimulating and intoxicating properties of alcohol (ethyl alcohol; ethanol; C₂H₅OH) have been known to man since pre-historic times. Its ready formation by the fermentation of carbohydrate has been practised by all human societies except the Eskimos. Starch deriving from grain, rice and potatoes, as well as glucose, fructose, sucrose, and even the milk sugar lactose, have all been used as the starting point for alcohol preparation. For millennia it has been recognised as a medicine, an anaesthetic, a soporific and, above all, as a social drink.

Once ingested alcohol is rapidly absorbed, primarily via the small bowel but also, to some extent, through the stomach wall. It is then distributed throughout the aqueous components of the body. It is assimilated most rapidly from drinks containing about 20 % by volume, although absorption at all concentrations is assisted by the presence of sparkling liquids such as tonic water, lemonade or Coca-Cola.

Once in the body, some alcohol is eliminated via the breath, sweat or urine, but in all but the most unusual circumstances, more than 95 % is broken down to carbon dioxide and water by alcohol dehydrogenase, principally in the liver but, to some extent, in other organs such as the stomach and lungs.

The strength of alcoholic drinks is now expressed in terms of its proportion by volume (% ABV). Thus, beer is 3 to 6 % ABV, wine 7 to 15 % ABV, liqueurs and fortified wines 17 to 25 % ABV, and spirits 35 to 60 % ABV.

However, in the past British measurements were conducted in terms of "Degrees of Proof Spirit" arising out of its long naval tradition. 100° proof spirit was defined as the minimum proportion of alcohol in water which, when added to gunpowder, still permitted it to explode. In the past sailors were allowed a daily ration of rum and demanded evidence that the spirit had not been diluted. Pure alcohol is 175° proof spirit.

Worldwide alcohol is the most used and abused drug. It has been estimated that at least 10 % of health

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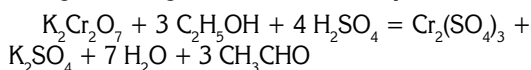
care costs can be attributed to alcohol, either due to a direct damaging effect on the body or injuries sustained or inflicted when an individual is drunk.

Unlike most other pharmaceutical compounds alcohol is a very impotent compound. Whereas most drugs are active in milligram or microgram quantities, tens of grams of alcohol require to be ingested before its effects become obvious. It is both a stimulant and a depressant. The loud voice, more intense laughter and increased self confidence will be apparent to all observers of the alcohol consumer as will be the morose, unhappy individual, sitting in the corner prone to tears.

ALCOHOL AND THE DRIVING LAW

The propensity of alcohol to impair driving skills has been recognised since cars were introduced to the road. In Britain, the offence of "Driving under the Influence of Alcohol" was, until 1967, assessed on the basis of the ability or inability to speak, stand on one leg or walk in a straight line. Although measurements of blood alcohol were introduced in Scandinavia before the Second World War, it was only in 1967 that the limit of 80 mg/100 mL was set in Great Britain. This figure was chosen following a study of accident potential associated with increasing levels of blood alcohol. Although alcohol harms mental and physical skills at all concentrations, the degree of impairment rises rapidly at levels above 80 mg/100 mL.

Drivers suspected of having a blood level in excess of the prescribed limit were required to breathe into a roadside screening device referred to as "The Breathalyser". A one litre bag is filled by breath passing through crystals of potassium dichromate impregnated with sulphuric acid. In the presence of alcohol the orange colour of potassium dichromate changes to the green of chromium sulphate.



If more than a fixed proportion of the crystals changed colour, the test was considered to be positive and a blood sample demanded.

In circumstances where the police considered it appropriate, it was in their power to replace the blood specimen with urine, the legal limit being changed from 80 mg/mL to 107 mg/100 mL because of the higher water content of urine. Since the alcohol content of urine is a reflection of that present in blood at the time of urine formation, rather than when it is

passed, the law requires that two specimens be taken within one hour of each other. The first is discarded and the second used for analysis.

Originally collection of a blood sample necessitated the attendance of a medically qualified Police Surgeon although it is now acceptable for a nurse to perform this function. Refusal to provide any of the specimens demanded automatically leads to the supposition of guilt of the offence of drink driving.

BLOOD AND URINE ANALYSIS

In all circumstances two samples of either blood or urine are taken into vessels containing sodium fluoride which acts both as a preservative and an anti coagulant. One sample is taken by the driver and the second is referred to a trained analytical scientist employed by the Forensic Science Service of the Home Office. The motorist can, if he wishes, have a private analysis performed in any of a number of centres equipped to offer that service and approved by the Royal Society of Chemistry, the professional organisation for chemists in the United Kingdom.

In order to establish the degree of variability in alcohol analysis, a number of specimens were submitted for assessment to all Forensic Science Laboratories in the country. Statistical analysis of the findings was undertaken and a standard deviation of 2 mg/100 mL established. In the light of this observation, the Home Office insisted upon quadruplicate analysis of all specimens by headspace gas liquid chromatography. Two entirely independent chromatographs are used having different columns and separate standardisation procedures, on each of which are performed duplicate analyses. The mean of the four measurements is then determined, any fraction of a milligram ignored and the resulting figure reduced by 6 mg/100 mL (three standard deviations) or 6 %, whichever is the greater.

Despite improvements to analytical technique which have taken place during the last thirty years, these requirements remain unchanged to the present day.

EVIDENTIAL BREATH ANALYSERS

Since 1967, technical advances have led to the breathalyser screening device now being replaced by

more sophisticated, fuel cell based, semi quantitative alcohol analysers. By 1981, the degree of development was sufficiently great to allow breath analysers to be introduced for evidential purposes. Initially they relied upon infrared measurement of the C-H stretching signal at 3.39 μm to 3.48 μm . Although there are many compounds other than alcohol found in breath which can absorb at this wavelength, the only ones likely to be present in a quantity sufficiently great materially to affect the measurement of alcohol, are acetone, in diabetics, and hydrocarbon solvents in those who habitually inhale such compounds. Detectors for these materials were incorporated into analysers and, if they were found to be present, a blood sample was preferred to breath.

The latest generation of evidential breath analysers is specific for ethyl alcohol.

THE LEGAL LIMIT FOR ALCOHOL IN BREATH

The simultaneous analysis of blood and breath samples from a large number of volunteers established an average blood/breath ratio of 2300. Thus at a blood alcohol concentration of 80 mg/100mL the corresponding breath level was 35 $\mu\text{g}/100\text{ mL}$. This became the legal limit for alcohol in breath. Two specimens are taken and, provided that they differ by less than 15 % of the lower of the two, this figure is used for evidential purposes.

However, because breath measurements are performed by police officers rather than trained scientists, no further action against the motorist will be taken until the lower of the two readings reaches 40 $\mu\text{g}/100\text{ mL}$. Even then, the motorist will be offered the chance to replace the breath analysis with one of blood or urine provided that the breath level does not exceed 50 $\mu\text{g}/100\text{ mL}$. At levels above this figure, the breath level stands and is used for the purposes of prosecution.

PENALTIES OF DRIVING WITH AN ALCOHOL LEVEL IN EXCESS OF THE PRESCRIBED LIMIT

The minimum penalty for a first offence of driving with a blood, breath or urine alcohol in excess of the legal limit is a ban from driving for twelve months accompanied by a substantial fine. Dependent upon

the magnitude of the measured level the ban may be extended up to three years and, in very severe cases, be accompanied by imprisonment, although such a penalty is exceedingly unusual.

For a second offence, committed within ten years of the first, the minimum ban increases to three years, while a third offence committed within ten years leads to a ten year ban.

In recent years, alcohol appreciation courses have been introduced. These are offered to convicted drivers and, anyone agreeing to participate in such a course, at a cost to themselves of about 300 euros, may have the period of disqualification from driving reduced by 25 %.

If an individual is deemed to be "in charge" of a motor vehicle with an elevated body burden of alcohol rather than driving that vehicle then, while disqualification from driving is a sentence available to the Court, it is not mandatory. Depending upon the nature of the offence, a ban may or may not be applied.

In circumstances where the Court believes an offence to have been particularly grave, it can insist that, before the licence to drive is returned, a fresh driving test be undertaken.

SPECIAL REASONS NOT TO TAKE AWAY A LICENCE

Because of the importance to most people of their driving licence, massive efforts have been made over the years by drivers to avoid disqualification once an elevated alcohol level has been demonstrated. Technical reasons e.g. the failure by police officers to apply the law exactly, have now been almost totally eliminated. Only two so called "special reasons" applications now remain.

Consumption of a drink in ignorance of its alcohol content

This includes the ingestion of a drink while unaware either that it contains alcohol or the level of alcohol which prevails. It includes "spiked drinks" i.e. the deliberate addition, usually of vodka, to drinks when the consumer is unaware of that fact.

Other arguments in this category include the drinking of a medicine which, unbeknown to the drinker, contains alcohol. Such medicines are not

uncommon, but are rarely taken in sufficient quantity to provide a strong case.

More often a plea may be that a beer or lager which was thought to be non-alcoholic did indeed contain alcohol.

All these applications will fail if the Court concludes that, even if alcohol was consumed in ignorance, the motorist should have been aware of the fact that something was amiss because of the effect it must have had on his demeanour.

By far the most common claim among these is that alcohol has surreptitiously been added to drinks for fun or some other reason. For such a defence to succeed the individual responsible for the action must come to Court and explain their actions. This must be undertaken with caution since, if the Magistrates consider what was done to have been sufficiently reprehensible, they can respond by withdrawing the licence of that individual rather than the driver.

Hip-Flask Defence

In these cases the driver admits to having alcohol in excess of the prescribed limit at the time of testing but claims that, after driving was completed, but before being subjected to testing, he consumed alcohol. This may occur in circumstances following an accident when the motorist returns home in a state of shock and then drinks alcohol.

In all cases involving special reasons arguments, it is necessary to submit forensic evidence through an expert witness. That person will be expected to demonstrate by calculation that the total intake of alcohol is consistent with what was measured in the driver, having made an allowance for alcohol elimination taking place over the time course of events. In addition they must establish that, without the extra alcohol from whatever source it comes, the driver would have been below the legal limit both at the time of testing and, of equal importance, at the time of driving.

EFFECT OF MEDICATION ON BLOOD ALCOHOL

A common claim among people shown to have been driving with an excess of alcohol is that their body burden has been affected by drugs which they have been taking. This can only succeed if the medicine contains alcohol and was taken in ignorance of that

fact (see above). Many linctuses comprise as much as 20 % alcohol but, even so, it is only rarely that they are taken in sufficient quantity to affect the analytical findings significantly.

Some compounds have been shown to bring about an elevation in the blood level of alcohol e.g. aspirin, H₂-receptor antagonists, propranolol, indoramin, usually as the result of inhibition of alcohol dehydrogenase, especially the enzyme present in the lining of the stomach. In United Kingdom law this observation cannot be used as a defence to the charge of drink driving. It may be offered only in mitigation of the offence thus leading to a less severe sentence.

ARE ALCOHOL LIMITS IN THE UNITED KINGDOM TOO HIGH?

Most countries of the world now apply alcohol limits less than those of the United Kingdom; 50 mg/100 mL is common. In some countries the presence of any alcohol at all is considered to be an offence, although in practice the limit is usually 10 mg/100 mL to allow for such sources as intestinal fermentation. Although many observers consider that an 80 mg/100 mL limit is too high, any plan to reduce it would undoubtedly result in such an outbreak of opprobrium that it would be a brave government which contemplated such a change.

However, the present limit does sometimes lead to a false perception by drivers about what they can safely have to drink without exceeding the legal limit. This may lead to over indulgence which would be largely eliminated if the permitted maximum level were to be drastically reduced. It will be of interest to see how the reduction of the permissible limit to zero in Croatia affects the incidence of drink driving.

IS THE PUNISHMENT FOLLOWING A CONVICTION FOR DRINK DRIVING TOO SEVERE?

The penalties appropriate to be visited on drink drivers are very much a matter of opinion. Many consider that if, after drinking, one causes death or serious injury to innocent people then a very severe punishment should be imposed. However, such cases are relatively rare. Most drink drivers are discovered either by chance or as the result of a

minor transgression of the motoring law observed by the police.

If the possession of a driving licence is essential for one's work or lifestyle then, clearly, it is an extremely foolish act to run the risk of disqualification for the sake of a glass of beer. Nevertheless, to deprive an individual of their livelihood, often accompanied by the punishment of other family members who have

contributed nothing to the offence, but who may be dependant upon the driver for transport, and when no harm has been done to anyone, does sometimes seem to be particularly savage.

However, whether this is so or not we can rest assured that as long as there are motor cars and alcoholic drinks in this world there will be people who cannot resist the temptation to combine the two.

Sažetak**KONZUMACIJA ALKOHOLA I UPRAVLJANJE VOZILIMA U VELIKOJ BRITANIJ**

Opisuje se povijest i vrijedeća zakonska regulativa vezana uz konzumaciju alkohola i upravljanje vozilima u Velikoj Britaniji. Opisani su probirni testovi i analitičke metode za utvrđivanje alkohola u krvi, mokraći i zadahu. Granica za koncentraciju alkohola za vozače iznosi u krvi 80 mg/100 mL, u mokraći 107 mg/100 mL te u zadahu 35 μ g/100 mL.

Kazne za prekoračenje ove granice kreću se u rasponu od zabrane upravljanja vozilom u trajanju od 12 mjeseci za one koji su prekršaj počinili prvi put, tri godine za ponovljeni prekršaj, a do 10 godina za prekršaj ponovljen treći put i više. U prilogu se također razmatraju posebni razlozi kada ne bi trebalo oduzimati vozačku dozvolu i kako lijekovi utječu na razine alkohola. Na koncu se također razmatra je li dopuštena granica u Velikoj Britaniji previsoka te jesu li predviđene zakonske kazne prestroge.

KLJUČNE RIJEČI: *alkohol u krvi, alkohol u zadahu, analiza alkohola, etanol, utjecaj lijekova, zakonske kazne, zakonska ograničenja*

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