

No- and low-alcohol drinks

Alcohol has long been a part of British culture, but it also poses health risks. Public awareness of alcohol-related harm has increased through health campaigns, leading to a rise in the availability of no- and low-alcohol products. **James Sayer** examines the impact of these products



Hidden harm of alcohol

Alcohol misuse in England is estimated to cost over £27 billion each year, causing widespread physical, psychological and social harm. This includes liver and cardiovascular diseases, mental health disorders and domestic issues. Ethanol ($\text{CH}_3\text{CH}_2\text{OH}$), the intoxicating compound in alcoholic drinks, is ranked among the most poisonous substances, underlining its toxic effects on almost every cell in the body.

Uniquely among social drugs, alcohol acts as a harmful toxin when consumed, despite its common and accepted use. The toxicity of ethanol is partly due to its oxidation to ethanal (CH_3CHO , Figure 1), a highly reactive and toxic compound – some researchers regard ethanal as the culprit behind hangovers.

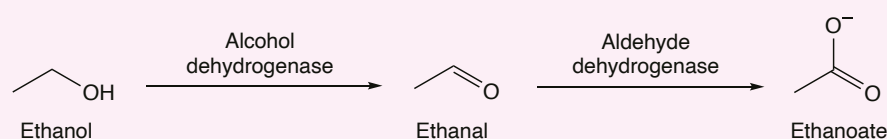
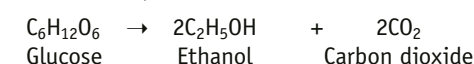


Figure 1 Ethanol is metabolised by enzymes in the liver

Confused by the label?

The rise of alcohol-free drinks has led to public confusion over terms like 'low alcohol' and 'alcohol-free'. In the UK beverages with up to 0.05% ABV (alcohol by volume) are classified as alcohol-free. This is comparable to the ethanol content found in orange juice or ripe bananas (as bananas ripen, yeast present on the surface converts sugars into ethanol and carbon dioxide):



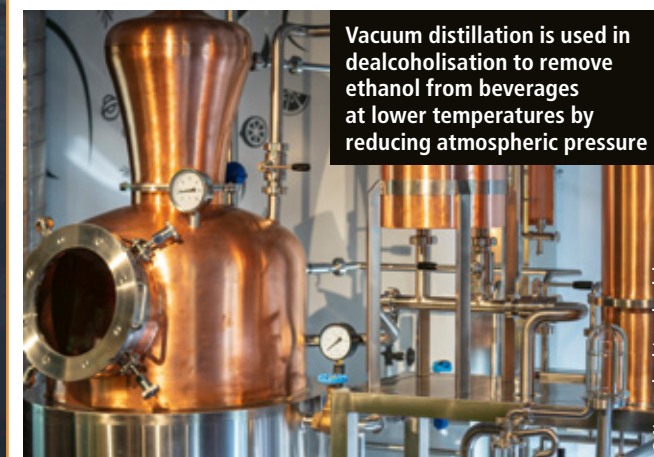
However, drinks with up to 1.2% ABV can still be labelled 'low alcohol'. Adding to the confusion, the EU classifies drinks with up to 0.5% ABV as 'alcohol-free,' creating inconsistencies in branding and consumer trust across markets, while potentially misleading those avoiding alcohol entirely.

Alcohol-free versus calorie-free

Cutting back on alcohol is often seen as an effective way to reduce calorie intake and support weight loss, by removing so-called 'empty' calories. Some alcoholic drinks are marketed as low in sugar to appeal to calorie-conscious consumers. However, while sugar contains 4 calories per gram, alcohol delivers nearly double that amount, at 7 calories per gram. Despite this, UK labelling laws for alcoholic beverages only require the product name, alcohol content (if over 1.2%), allergens and a durability date – ingredient and nutritional information are not mandatory. In contrast, non-alcoholic drinks must meet full food labelling regulations, including ingredient and nutrition data, offering better transparency for those managing their diet and health.

Ethanol pain and economic gain

Around one third of people who stop drinking alcohol cite financial reasons as their main motivation. However, alcohol-free alternatives are not always a cheaper option. In 2024 the average price of non-alcoholic beer in pubs, bars, clubs and nightclubs reached £9.04 per litre – significantly higher than the £7.15 per litre for regular beer. The higher cost of alcohol-free beer is often due to more complex production methods, specialised ingredients and packaging costs.



Vacuum distillation is used in dealcoholisation to remove ethanol from beverages at lower temperatures by reducing atmospheric pressure

The rise of functional drinks

'Functional drinks' are non-alcoholic beverages formulated to mimic some biological effects of alcohol without containing ethanol or causing its associated toxicities. For example, L-theanine (Figure 2), an amino acid found in tea leaves, is increasingly being added to functional drinks, particularly those aimed at improving focus and reducing anxiety.

Functional drinks generally have low caloric content but their complex production processes contribute to elevated manufacturing costs, which are reflected in higher consumer prices. Ongoing research and development will yield critical insights into changing consumption trends and the biochemical mechanisms that underpin alcohol alternatives.

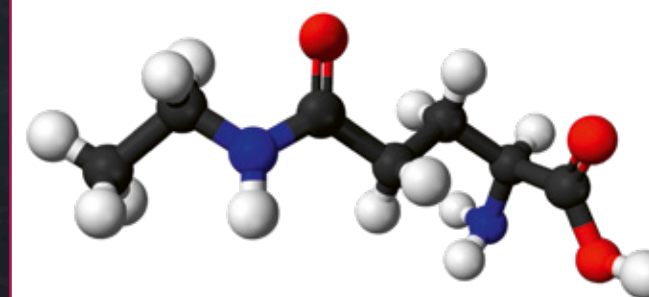


Figure 2 L-theanine

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