

FUNCTIONAL DRINKS



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Functional beverages have been gaining popularity, with products now offering a host of nutrients and bioactive ingredients. With rising interest in healthy aging and preventative medicine, new functional drinks have been designed to target specific health concerns. This article examines the claims and health benefits of ingredients/nutrients added to functional drinks and gives examples of products available to UK consumers.

Beverages have steadily gained popularity over the last decade. Data from the latest DEFRA survey show that household purchases of soft drinks (especially low calorie brands) have risen over the last 10 years from an average of 1,448ml to 1,630ml per person per week (1). A large European survey found that 30 percent of adults, 68 percent of adolescents and 18 percent of children consumed energy drinks, with around 12 percent classified as high/acute consumers (2).

These changes in beverage habits are influenced by growing interest in functional products and ingredients. According to market analyst, Mintel, the functional beverage market continues to grow despite the recession, dominated by the energy, digestive health and sports categories with so-called 'shots' featuring widely. Surveys show that functional products are more successful when consumers are familiar with the ingredients and/or their claimed effects (3). However, claims on labels are not always read or understood, with lack of motivation being a major barrier (4).

COGNITIVE FUNCTION AND ENERGY
Improved consumer understanding and increased pressure to be 'mental-

ly alert' have led to a number of new products being developed which are targeted at supporting cognitive function and improving perceived energy levels. Indeed, 'energy' has been identified as a top consumer health trend by analysts (5).

As shown in Table 1, several EU health claims have been authorised (6). Water, iodine, iron and zinc ingestion have proven cognitive benefits, docosahexaenoic acid (DHA) has a role in normal brain function, while B vitamins and calcium, iodine, iron, phosphorous and vitamin C contribute to normal 'energy-yielding metabolism', i.e. help to support energy levels. Positive opinions on caffeine, including claims relating to mental and physical performance (7), have been published and may yet translate into authorised claims if the European Parliament's concerns about high intakes can be addressed. An energy claim is also pending for glucose. While claims have not been approved for taurine, guarana, ginseng and glucuronolactone, these are often added to beverages and there is some evidence that they may enhance cognitive performance (8).

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Table 1: Approved EU health claims for cognitive function and energy

Nutrients/ingredients	Authorised claim	Condition of use
With proven cognitive benefits		
Water	Maintenance of normal physical and cognitive functions	In order to obtain the claimed effect at least 2.0L of water, from all sources, should be consumed per day.
DHA	Maintenance of normal brain function	Product must contain at least 40mg DHA per 100g and per 100kcal. Consumers must be informed that the beneficial effect is obtained with a daily intake of 250mg of DHA.
Iodine, zinc	Normal cognitive function	May only be used for a food/product which is at least a source of the named nutrient.
Iron	Normal cognitive function; normal cognitive development of children	
Vitamins B1, B6 & B12, biotin, folate, niacin, magnesium, vitamin C	Normal psychological function	
With proven effects on energy		
Calcium, iodine, iron, phosphorous thiamine, vitamins B6 & B12, vitamin C	Normal energy-yielding metabolism	May only be used for a food/product which is at least a source of the named nutrient.
Folate, niacin, vitamins B2, B6 & B12, pantothenic acid, iron, magnesium, vitamin C	Reduction of tiredness and fatigue	

Note: To make 'a source' claim, a product must contain at least 15 percent of the Recommended Daily Allowance for the claimed nutrient. Source: European Parliament and Council (2007).

Examples of products include Lucozade Re-*rive* (9), which is a low sugar energy drink containing a source of niacin, pantothenic acid, vitamins B6 and B12, acai extract and a moderate amount of caffeine. So Good is another example which, this time, provides DHA for brain function, derived from flaxseed. Souvenaid from Danone is a new prescription functional drink, containing 1,200mg DHA and 300mg of eicosa-pentaenoic acid (EPA) and targeted at patients at risk of dementia (10).

HYDRATION AND SPORT

Sports drinks are commonly used to reduce fluid losses, heat stress and maintain performance when exercising (11). The type of drink required depends on the timing and duration of training. For endurance activities, drinks should contain carbohydrate for energy (e.g.

glucose, maltodextrin) and electrolytes to replace sodium losses in sweat (ideally 0.3-0.7g Na/L). Post-exercise (whether endurance or resistance), drinks with a mix of carbohydrates, electrolytes and protein support hydration and muscle recovery. Antioxidants and certain amino acids may also help, although evidence for these is mixed (12). Two health claims has been approved for carbohydrate-electrolyte solutions which are proven to support performance and enhance water absorption during prolonged exercise.

While sports drinks are widely used by consumers, they are not appropriate for everyone. High-calorie products may contribute to weight gain, additional sodium is not required for most sedentary people, while drinks with a high glycaemic load may be unsuitable for those with diabetes (13). This has led manufac- ▶

Table 2: Approved EU health claims for immune function

Nutrient/ingredient	Claim	Condition of claim
Copper, Folate, Iron, Magnesium, Selenium, Vitamin A, Vitamin B12, Vitamin B6, Vitamin C, Vitamin D, Zinc,	Copper contributes to the normal function of the immune system.	May only be used for a food/product which is at least a source of the named nutrient.
Vitamin C	Vitamin C contributes to maintain the normal function of the immune system during and after intense physical exercise.	Food must provide a daily intake of 200mg vitamin C. Consumers must be informed that that the beneficial effect is obtained with a daily intake of 200mg in addition to the RDA for vitamin C.

Note: To make ‘a source’ claim, a product must contain at least 15 percent of the Recommended Daily Allowance (RDA) for the claimed nutrient. Source: European Parliament and Council (2007).

turers to design lower calorie sports drinks, e.g. Lucozade Sport Lite provides only 50kcal per 500ml, but contains electrolytes for hydration and B vitamins for energy release making it suitable for short workouts. Another healthier example is Beet It which contains natural beet-root juice. This is naturally high in nitrate and is converted in the body to nitric oxide which has been shown in studies to improve sporting performance (14). High protein drinks, such as Maximuscle, are useful for supporting muscle development, strength and recovery, but are designed for regular exercisers rather than sedentary individuals who already consume enough protein from foods. Protein drinks are convenient immediately post-exercise when other dietary sources, e.g. meat and eggs, are not readily available.

HEART HEALTH

Omega-3 fatty acids, isoflavones, flavonoids, plant stanol/sterols, soluble fibre and lycopene have all been linked with improvements in cardiovascular disease risk factors. Black and green teas are good sources of flavonoids, plant compounds which act as antioxidants. Consumption of around four cups of tea daily improves endothelial function and is associated with a reduced risk of myocardial infarction (15). Other flavonoid-rich beverages include Pom Wonderful, a pomegranate juice rich in anthocyanins and Alpro soya, which contains isoflavones. While flavonoids have been found in many studies to lower cholesterol, improve vascular function and display antioxidant and

anti-inflammatory effects (16), no EU health claims for tea, fruits or soya have yet been authorised. This is due to issues characterising the foods or identifying the exact mechanisms involved.

However, claims have been authorised for other ingredients. For example, Benecol and Flora Pro.activ yoghurt drinks containing plant stanols/sterols have a cholesterol-lowering claim, while drinks containing a concentrated tomato ingredient, e.g. Sirco, can claim to support a healthy circulation as they maintain normal platelet aggregation. One polyphenol claim could be approved in future as cocoa flavanols received a positive scientific opinion for supporting normal vasodilation (17). Heart health claims are already being made by beverages such as Cocoa Joe.

IMMUNE FUNCTION

Certain nutrients and ingredients have been found to support immune system and can leverage health claims (Table 2). While Echinacea, cranberries and acai have been linked with immune function benefits, no claims have been authorised.

Examples of beverages targeted at immune function support include Ribena Plus, which is a source of vitamins A, C and E but contains no added sugar, Actimel, which offers probiotic bacteria and vitamin C and Ocean spray, which contains cranberries, a rich source of proanthocyanidin, quercetin and vitamin C.

Probiotics remain controversial because EU health claims were rejected despite a large body ▶

of evidence reporting benefits to immune function and disease risk. The main scientific barriers were resistance to the idea that boosting levels of 'good bacteria' in the gut represented a real health benefit and problems characterising the strains of bacteria used in studies. However, consumer interest in probiotics remains strong, leading to the development of new ambient products which use probiotic encapsulation technology to prolong the survival of the microorganisms (18). The lack of claims has not stopped immune claims on probiotic products as manufacturers now just add vitamin C which has an authorised immune function claim.

OTHER AREAS

Other functional beverages contain calcium for bone health, such as Ribena Plus with calcium, or low glycaemic carbohydrates, such as isomaltulose, to deliver improved blood glucose control. New areas for the future are likely to include weight management, satiety and beauty. These include products which contain vitamin C, vitamin E and even collagen, although the effectiveness of this is unclear.

Antioxidants are also being used clinically in beverages to lower the risk of neurological disorders, such as Parkinson's disease and Alzheimer's, although more evidence is required to establish the long-term benefits (19).

CONCLUSIONS

Functional drinks are an innovative way of delivering nutrients and bioactive ingredients to help maintain health and well-being. Many ingredients now have authorised health claims to support the communication of their benefits, e.g. B vitamins and omega-3s.

When making beverage choices, consumers should favour those with a lower calorie content and use products appropriately, e.g. sports drinks for exercise. Caffeine levels also need monitoring. A systematic review of 41 studies found that low to moderate caffeine intakes (37.5mg to 450mg per day) generally had positive effects on cognition and performance, while caffeine intakes up to 400mg per day did not adversely affect hydration, even in active subjects (20). High caffeine products are unsuitable for pregnant women or young children. ■

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