Market trends and opportunities for functional dairy beverages

Introduction

Current developments in functional foods are fuelled by the rapid increase in lifestyle diseases and the desire by innovative companies to seize the resulting opportunities to market bioactive ingredients addressing these diseases. The slow pace of regulatory approvals for functional foods and bioactive ingredients is constantly being challenged by the rapid increase in innovative ingredients and a desire to make health claims. Although Japan leads in the development and approval of functional foods, the US and Europe are closely behind. This has allowed these countries to lead in the innovation and capture of intellectual property in the area of functional foods and bioactive ingredients. Today, supermarket shelves in US, Europe and Japan carry a range of functional dairy beverages with probiotics, prebiotics, omega-3, plant sterols and many other components.

Market trends

According to Stagnito’s New Products Magazine (Penn 2005), the development focus for beverages for 2005 will be heavily dominated by health (53%), followed by taste (25%) and convenience (23%). In identifying the Top 10 trends, similar predictions are made by the market analysis company, New Nutrition Business (2005). In her annual review of the Top 10 global trends, Sloan (2005) identified health and convenience as the key trends for food products.

Market trends indicate that although the inherent functional benefits of milk remain largely unexploited, milk-based beverages are proving to be ideal vehicles for newly discovered bioactive food ingredients. In the past couple of years, a number of functional dairy beverages containing a range of non-dairy bioactive additives have been launched, mainly in the US, Europe and Japan. Non-fermented, milk-like beverages and fermented yogurt drinks have been used as vehicles for bioactive food ingredients. Tables 1 and 2 highlight selected examples of non-fermented and fermented dairy beverages, respectively.

Two bioactive ingredients targeted for functional dairy beverages are omega-3 fatty acids and plant sterols. In general, low-fat milks appear to be preferred for fortification with omega-3 fatty acids, while probiotic yogurt drinks have been preferred for fortification with plant sterols and stanol esters.

Omega-3 fatty acids are polyunsaturated fatty acids that are considered essential because they cannot be synthesised by the human body. Dietary sources of omega-3 fatty acids include plants (particularly flax, canola, walnuts and hemp) and fish (particularly ocean fish such as sardines, anchovies, salmon and mackerel). Plants contain the parent omega-3, alpha-linolenic acid (ALA), which can be converted into eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). A number of dairy beverages containing omega-3 fatty acids from plant and marine sources have been launched in the US, Canada, Europe and Australia. In Canada, in order to claim a source of omega-3, the food must contain 300 mg/serving. According to USDA, the acceptable limit for an adult male is 1600 mg/day and for an adult female is 1100 mg/day.

The Heart Foundation in Australia recommends 200 mg of omega-3 (including ALA) a day. According to Canadian dairy company Natrel, omega-3 fatty acids:

- promote the reduction of blood cholesterol;
- prevent certain illnesses, such as cardiovascular disease;
- foster brain and visual development in children;
- improve immune reactions against allergies; and
- reduce the risk of forming blood clots.

Other bioactives included in functional dairy beverages are minerals (calcium, magnesium and iron), peptides and lactoferrin.

Abstract

Functional foods promise to deliver health and wellness to consumers in an environment where lifestyle diseases and an ageing population are threatening the wellness of society. Milk is a natural, multi-component, nutrient-rich beverage. Market trends indicate that milk-based beverages are ideal vehicles for newly discovered bioactive food ingredients targeting lifestyle diseases. Low-fat milk and drinking yogurt are the most commonly used vehicles for the delivery of bioactive food ingredients. Among the recent trends, low-fat milk is commonly used for delivery of omega-3 fatty acids, while probiotic yogurt drinks are preferred for the delivery of plant sterols. Drinks containing combinations of dairy and fruit juices with added bioactive components are also becoming common in the US and EU markets. Although a range of bioactive components is available for incorporation into dairy beverages, there are significant formulation challenges. Experience indicates that consumers will not buy food products that imply they are sick. Therefore, functional foods need to be promoted as convenient, nutritious and tasty formulations with specific health benefits. Although health claims in Australia remain elusive, innovations in functional dairy beverages are likely to follow the trends in the US and Europe. Australian manufacturers need a proactive, rather than a reactive, approach to the development of innovative functional dairy beverages.

Aust. J. Dairy Technol. 60, 195-198
Table 1: Selected examples of non-fermented functional dairy beverages with added bioactive components.

<table>
<thead>
<tr>
<th>Functional dairy beverage</th>
<th>Brand name</th>
<th>Manufacturer</th>
<th>Source of bioactive</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-fat milk</td>
<td>Lactantia</td>
<td>Lactantia (Parmalat), Canada</td>
<td>Omega-3 (flaxseed oil)</td>
<td>300 mg/250 mL serve, mainly ALA</td>
</tr>
<tr>
<td>Low-fat milk</td>
<td>Heart Plus</td>
<td>PB Foods Australia</td>
<td>Omega-3 (fish oil)</td>
<td>200 mg/250 mL serve, mostly DHA and EPA</td>
</tr>
<tr>
<td>Low-fat milk</td>
<td>Natrel</td>
<td>Natrel, Canada</td>
<td>Omega-3 (organic flaxseed oil)</td>
<td>300 mg/250 mL serve</td>
</tr>
<tr>
<td>Low-fat milk (Fresh)</td>
<td>Dawn Milk</td>
<td>Dawn Dairy, Ireland</td>
<td>Omega-3 (fish oil)</td>
<td>150 mg/250 mL serving. Europe’s first, fresh pasteurised omega-3 milk. DSM supplied omega-3 is added at final stage of production using TetraPak-developed dosing system</td>
</tr>
<tr>
<td>Low-fat milk</td>
<td>Farmers Best</td>
<td>Dairy Farmers, Australia</td>
<td>Omega-3 (vegetable oils)</td>
<td>33 mg/250 mL serve. First product to be made from fresh milk where almost all saturated fat has been replaced with the healthier monounsaturated and Omega-3 fats. Approved by the National Heart Foundation of Australia</td>
</tr>
<tr>
<td>Low-fat milk (UHT) and milk powder</td>
<td>Omega Plus</td>
<td>Nestlé, Malaysia and Singapore</td>
<td>Omega-3 (vegetable oil - canola and com oil)</td>
<td>UHT and powdered milk</td>
</tr>
<tr>
<td>Milk</td>
<td>Meiji Love</td>
<td>Meiji Milk, Japan</td>
<td>Calcium and Iron</td>
<td>350 mg calcium and 3 mg iron per 200 mL serve</td>
</tr>
<tr>
<td>Milk-fruit juice drink</td>
<td>NaturaLinea</td>
<td>Corporacion Alimentaria Penanenta S.A. Spain</td>
<td>Conjugated linoleic acid (CLA) (Tonalin Penananta S.A. brand from Cognis)</td>
<td>Carries the health claim “helps to reduce body fat”</td>
</tr>
<tr>
<td>Low-fat milk</td>
<td>Flora Pro-Activ</td>
<td>Unilever, UK</td>
<td>Phytosterol</td>
<td>Carries the claim “clinically proven to reduce cholesterol”</td>
</tr>
<tr>
<td>Hyper-immune milk (powder)</td>
<td>Stolle Milk Alpha</td>
<td>Stolle Milk Biologics (US)</td>
<td>Casein-phospho-peptide (CPP) &amp; IgG</td>
<td>Distributed in South-East Asia by Eurotai</td>
</tr>
<tr>
<td>Low-fat milk</td>
<td>Night Time Milk</td>
<td>Cricketer Farm, UK</td>
<td>Melatonin</td>
<td>Promoted as a natural solution for good night sleep</td>
</tr>
</tbody>
</table>

Selective recent examples of functional dairy beverages containing omega-3 fatty acids are shown in Table 1.

Fermented dairy beverages containing phytosterols have been launched both in the US and Europe. Phytosterols (including stanol esters) are promoted for their cholesterol-lowering action that is achieved by suppressing intestinal cholesterol absorption while partially suppressing cholesterol biosynthesis. Yogurt with active probiotic cultures has been known to improve the intestinal microbial balance and improve gut health. Yakult and Danone brands dominate the probiotic yogurt market. Each daily dose bottle of Yakult is believed to contain 6.5 billion active bacteria of the strain Lactobacillus casei Shirota. Several studies have

Table 2: Selected examples of fermented functional dairy beverages with added bioactive components.

<table>
<thead>
<tr>
<th>Functional dairy beverage</th>
<th>Brand name</th>
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<th>Source of bioactive</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yogurt drink</td>
<td>Flora ProActiv</td>
<td>Unilever, UK</td>
<td>Phytosterol</td>
<td>Claims “clinically proven to reduce cholesterol”</td>
</tr>
<tr>
<td>Yogurt drink</td>
<td>Benecol</td>
<td>McNeil Nutritional, UK</td>
<td>Phytosterol</td>
<td>Licensed technology from Raisio, Finland. Contains 3% phytosterol ester</td>
</tr>
<tr>
<td>Low-fat dairy drink</td>
<td>Danacol</td>
<td>Danone</td>
<td>Phytosterol</td>
<td>1.6 g phytosterol/100 mL bottle. Claims “consuming 1.6 g of plant sterols per day, as part of a healthy diet, is proven to reduce cholesterol”</td>
</tr>
<tr>
<td>Fermented milk drink</td>
<td>Zen</td>
<td>Danone, Belgium</td>
<td>Mg</td>
<td>Zen is targeted at the whole family, particularly those people who want to relax at the end of the day.</td>
</tr>
<tr>
<td>Fermented dairy - fruit beverage</td>
<td>Evolus</td>
<td>Valio, Finland</td>
<td>Bioactive peptides obtained by milk fermentation</td>
<td>Evolus claims to be the first European functional food to help lower blood pressure</td>
</tr>
<tr>
<td>Probiotic fermented milk</td>
<td>L. casei + Lactoferrin</td>
<td>Kyodo Milk, Japan</td>
<td>L. casei, lactoferrin</td>
<td>Promoted as anti-bacterial and preventing infections</td>
</tr>
</tbody>
</table>
shown the health benefits of probiotic bacteria. However, the market has become fairly crowded and, therefore, recently developed yogurts have also seen addition of other bioactive ingredients, such as lactoferrin, plant extracts and fibres. Selected recent examples of fermented functional dairy beverages containing bioactive ingredients are shown in Table 2.

In addition to the perceived health benefits, functional dairy beverages have also been marketed based on unique packaging, convenience features (e.g. single serve) and refreshing taste. In Japan, functional dairy beverages are seen as foods and consumers don’t even use the term ‘functional foods’. As all foods must taste good, functional foods are considered no exception. It appears that people will not compromise on taste, because they want to enjoy their food regardless of health status. Therefore, producing a great-tasting functional beverage that fulfils a real consumer need for health remains the key to success.

Australasian perspective

Australia, although being a major exporter of food and agricultural products, has been slow in responding to the newly emerging consumer market needs, and developing intellectual property in functional food and bioactive ingredients. This could partially be attributed to the slow pace of approval for novel foods and health claims and partly due to the risk-averse nature of food companies who have failed to inject sufficient funds into R&D and innovation. On the other hand, Australia and New Zealand cannot ignore the market trends and consumer needs and this is recognised by the Food Standards Australia New Zealand (FSANZ).

Slow advances in developing functional foods have many long-term implications to the food industry, such as:

- innovation in the development of bioactive ingredients and functional foods has been stifled due to the uncertainty in marketing the products;
- there is little or no IP protection or positioning by Australian companies in a number of already launched bioactive components for functional dairy beverages, such as phytosterol and omega-3 fatty acids;
- Australian manufacturers may have to rely on licensing technologies from overseas and their profit margins are likely to be eroded; and
- the awareness among consumers is limited and hence marketers may need large budgets for promotions.

On the positive side, there are a number of advantages that can be gained by the wait-and-see approach. These are:

- A number of bioactives have been tried in functional dairy beverages, so there is some information about processing and technology.
- Information on the market success or failure of already launched products can be useful in positioning products by Australian manufacturers.
- There is some feedback from consumers and hence an ability to improve products to meet their needs.
- There is information about pricing and the premium that is likely to be available.
- There is some information on health benefits and a number of consumer products have been put through clinical trials overseas.
- Overall risks are minimised.

Opportunities and challenges for functional dairy beverages

Dairy beverages easily fulfil the requirements for the three main drivers of functional foods, i.e. health, taste and convenience. Among the many drivers for the growth of functional foods, the health concerns of consumers and rising healthcare costs for health authorities remain the most important. A good understanding of the health needs of the population can create opportunities for functional dairy products. The rise in obesity appears to be one of
the biggest challenges in the society, but also offers unique opportunities for functional foods. As obesity is also linked to a number of lifestyle diseases, such as metabolic syndrome, cardiovascular disease (CVD), cancer and diabetes, developing functional dairy beverages targeting obesity alone can offer significant market opportunities.

The dairy industry needs to be aware of the major health-related concerns and address those concerns through functional dairy products. In a recent report, the Australian Institute of Health and Welfare (Australia’s Health 2004) highlighted CVD, cancers, diabetes, arthritis and other musculoskeletal conditions, high blood cholesterol and obesity as major health concerns for Australia.

Table 3 highlights some of the available opportunities and challenges for the development of functional dairy beverages. It includes bioactive ingredients that are likely to address some of the major lifestyle diseases and have potential to be approved by the FSANZ.

Table 3 also highlights that there are several formulation challenges that need to be overcome for the development of stable functional dairy beverages with desired taste attributes. For example, omega-2 fatty acids, which possess undesirable flavour and are sensitive to heat, require encapsulation to protect from flavour release and from processing, such as pasteurisation and UHT. The added bioactive ingredient may also interact with dairy components such as protein or minerals, causing physical instability during the processing of beverages or affecting the efficacy of the bioactive ingredient. Basically, each non-dairy bioactive ingredient, when added to a dairy beverage, poses unique challenges that require scientific and technological solutions.

Market experience indicates that consumers will not buy food products that imply they are sick. Future functional foods are likely to be promoted as nutritious and tasty Formulations with specific health benefits. Although health claims in Australia remain elusive for the time being, innovations in functional dairy beverages are likely to follow the trends in the US and Europe. A proactive, rather than a reactive, approach to the development of innovative functional foods is needed to catch up with Europe, US and Japan.

Conclusions

There is a growing trend for fortification of dairy beverages with non-dairy bioactive ingredients. Functional dairy beverages can satisfy the growing market need for health, taste and convenience, but the formulators require significant knowledge of the bioactive components and their interaction with dairy components.

References