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Prepared by: Dr Kleanthes Yannakou
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Locked Bag 991
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Analysis of the international wheat value added sectors

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1. INTRODUCTION

This report has been produced for Meat and Livestock Australia Limited (MLA) who are interested in learning from the value-added experience of other food sectors. This learning could be of use when considering the way forward for further R&D and marketing investment in value-added products derived from red meat.

In agreement with MLA, wheat-based products (such as bread) were identified as sectors that have made major strides in developing and successfully introducing value-added products. This sector is described using a combination of desk research, case studies, and interviews with key individuals.

In the wheat sector, the majority of wheat is sold to food manufacturers who add value with products such as bakery products, with bread (including speciality and nutritionally fortified bread) being the largest sector. The report provides an overview of the international and Australian wheat-based bakery sector, with a focus on identifying drivers for adding value, and summarising learning from these sectors.

In addition, a number of case studies are developed from the literature as well as interviews in the dairy and baking industry to establish answers to questions of interest to MLA such as:

- Has the core product influenced and been influenced by the perceptions of value-added products, such as health attributes?
- What are the conditions for success in developing and launching value-added products?
- Are there failures which provide insight and learning?
- Were difficulties encountered by the companies in "selling" the idea of value added products? How would companies change the way they sold the idea internally if they could have the time over?
- How was cannibalisation prevented or dealt with by management?

This report has been compiled from Australian and International sources, including: market research reports from Euromonitor International, Frost & Sullivan, IBIS, Research and Markets, and Business Insights; Food Statistics from organisations such as the Department of Agriculture, Fisheries and Forestry, and the UN's Food and Agricultural Organisation; information and reports from a number of major baking companies such as Nestle, Goodman Fielder, and George Westin Foods; Research Institutes, particularly Campden and Chorleywood Food Research Association (UK), Universities such as the Department of Agricultural Economics- North Dakota State, Wheat Value-Added CRC, and the Bread Research Institute in Australia; Wheat and Baking associations internationally and in Australia; Food, and Bakery Journals; and interviews with senior personnel and the Technical/Innovation Director of one of Australia's major bakery manufacturers/marketers.

2. INTERNATIONAL WHEAT VALUE-ADDED SECTOR

This section examines the international and Australian value-added wheat sector. The focus is on bakery products, particularly bread, which is the primary user of milled wheat to establish why there is a positive trend to increase value in contrast to other wheat-based sectors.

Market trends, and drivers are analysed, and a specific case study on functional bread is described.

2.1 OVERVIEW OF THE INTERNATIONAL WHEAT VALUE-ADDED INDUSTRY

Industry analysts predict that in 2010 the world bakery products market will be worth about US\$407 billion, with bread having the highest share at 48%.

The global demand for wheat is projected to grow modestly at 1.2% per annum for food and 0.8% per annum for feed.

While in western societies, wheat is static or showing a decline in per capita consumption with income growth, in Asia wheat is becoming a preferred staple. Traditional rice eating societies are consuming increasing quantities of wheat in the form of bread, cakes, pastry, and other products. Wheat is not being used as a substitute in a traditional manner but wheat consumption reflects western preferences.

Internationally, value-add for bakery products increased despite flour mill and cereal foods decreasing. In addition, the largest segment in the bakery sector, bread, is now growing despite decades of real decline in consumption per person. This trend is particularly apparent in the developing world, with the Asia-Pacific region expected to grow at about 7.0% per annum.

AUSTRALIAN MARKET TRENDS:

In Australia between 2003 and 2008, domestic usage of wheat decreased by 0.5% per annum in revenue.

Until 2006, bread consumption in Australia was also declining on the long term in Kg consumed per person, but increasing in value (dollars spent). Since 2007 however, this trend has reversed with projections of annual increases in consumption of about 3 to 4% to 2012 bringing total revenue to Au\$2276 million.

This increase is mainly due to innovations in ingredients and processing, and new product development. At least 90% of all households in Australia consume bread (with white sliced bread being the majority at 61%), but the type of bread purchased is changing; for example, high premium speciality breads now account for about 25% of bread sold versus 12% in 2001.

Increasing consumer interest in health has had an effect on the types and varieties of breads available. Wholemeal and mixed grain breads have not increased in sales – instead 'functional' white breads are driving the nutritional aspect of the bread market. The bread industry faces barriers to growth with competition from convenience breakfast and snack foods and a mixed image of bread as a healthy product.

The increase in bakery value-add has been accompanied (or driven) by a 32% per annum increase in R&D between 2001 and 2007, and is now at about 2% of sales, which is high by food industry standards (average of about 0.5%)

2.2 DRIVERS FOR WHEAT VALUE- ADDITION

The drivers of value-addition of wheat-based products are similar to other food categories:

Westernisation of diets in the developing world (particularly in Asia):

Rapid economic and income growth, urbanisation, and globalisation are leading to a shift of Asian diets away from staples such as rice and converging towards a western diet. The rapid spread of global supermarket chains and fast food restaurants are reinforcing these trends.

Changing food demand in Asia is increasing consumption per capita of wheat and wheat-based products such as baked wheat products including bread.

Changes in consumption patterns:

While urbanisation increases demand, the marked shift from cereal-based diets to energy-dense diets with more vegetable, oil, meat and sugar diminishes the relative importance of wheat in the diets of many middle and upper income countries. Moreover, as consumer's incomes rise, processed foods account for a higher proportion of food budgets with a corresponding decrease in wheat's share of food budget expenditure.

Similarly in Australia, as real disposable income has increased, a tendency to purchase more protein and fewer carbohydrates emerged. In recent years, however, consumers have been prepared to purchase more expensive specialist breads.

Changing lifestyles have also had an important impact on the demand for the products of the bread industry. The demand for a more varied range of bread and bread products has been reinforced by the changing ethnic structure of the Australian population. The wide availability of an increasing variety of 'traditional' or 'ethnic' breads, including foccacia, baguettes, bagels and flatbread, reflects the multi-cultural nature of Australia's population and its influence on eating habits.

Innovation, science and technology:

Science and technology has played an important role in allowing the baking industry to produce value-added products. This includes improving the quality of existing and new wheat varieties and products, developing new ingredients, and developing new products including packaging innovation.

Wheat value chains are being transformed by urbanisation, diet transitions, and growing concentration (such as retailing) in developing countries. There is increasing demand for food quality, including wheat flour quality. The preferred quality attributes and the volume demanded depends on the market. The global agricultural research system has generated improved germplasm and technologies which underpinned the past growth of the wheat industry, and the continued supply of improved lines and new technologies is

essential. As technologies become more knowledge intensive and production more responsive to markets, the importance of information and education to consumers is increasing.

Though the nature of the bakery industry offers limited scope for growth, changing consumer trends (such as demands for healthy, convenient and tasty food) has stimulated the bakery manufacturers to differentiate and develop innovative baked products. Manufacturers are developing new products incorporating natural ingredients, and introducing bread with functional qualities enriched with fibre and vitamins.

Packaging will play an important role in stimulating growth; prolonged storage life benefiting product freshness and flavour, quality-of-origin labels with health related information will also determine packaging developments.

These consumer trends have also provided opportunities for ingredient manufacturers e.g. trans-fat free emulsifiers.

Retailers:

One aspect of product market concentration is the growing strength of supermarkets, setting standards for quality, reliability, timeliness, and national/global purchasing policies. There is strong evidence of fast growth in value added in retailing.

Supermarkets are developing strong private labels which target the economy and premium end, putting pressure on the margins of bakery manufacturers.

Health, wellness, and nutrition:

Public awareness regarding healthy diets and nutrition has generally increased in the past decade, driven by government and private initiatives. Consumer trends towards healthier, nutritious foods have led to an increase in differentiated staple lines with products such as:

- Low/light bakery products with reduced fat and carbohydrates
- Functional bakery products through enhancing the nutritional value of traditional bakery products through the addition of functional ingredients, such as omega-3, multigrain
- Natural and organic bakery products that contain all natural ingredients.

The biggest trend affecting the market is functional products promoted as 'good for health'. The demand for functional foods in general has increased with the ageing baby boomer population, rising healthcare costs, and the rising incidence of lifestyle disorders such as obesity. Health products currently selling well include 'lite' foods targeted at various low fat and low carbohydrate diets. These are often sold in smaller portion sizes, increasing the 'healthy' image. The health trend is also encouraging bakery manufacturers to enlist the skills of ingredient manufacturers in order to add functional ingredients to products.

A survey commissioned by *Go Grains* indicated that 69% rated the health/nutritional value of wholemeal/ multi-grain/ mixed grain bread as excellent or very good. This contrasts with white bread, which was rated poorest for health and nutritional value. Consumers are increasingly concerned about the calorific content of bread and bread products. However, increasing awareness of the links between certain foods and

diseases such as cancer and heart disease has resulted in much greater awareness of the importance of high-fibre diets. This has encouraged the consumption of wholemeal and mixed grain breads.

Consumer interest in health has had a marked effect on various facets of the baking industry. An example is the effect on the types and variety of bread eaten:

- Wholemeal and mixed grain breads have increased in popularity and currently account for 20% of bread sales. White bread accounts the majority of all bread sold, but sales have declined from about 90% in the early 1980s to the current level of 60%. However consumer interest in health and nutrition does not appear to be fully reflected in increased sales of wholemeal or mixed grain breads, as would be expected. This is in part due to the development of new varieties of breads
- Breads are now produced with specific health attributes, such as high fibre, soy and linseed, omega-3 fatty acids, high calcium and high fibre white bread, elevating these breads from commodity status to functional food. This opportunity was realised by the industry in part to target an ageing population who have higher disposable incomes. The growth in hot bread shops and small bakeries has also resulted in a wide range of bread products
- Premium ranges produced by specialised bakers include products such as sourdoughs and 'bush-breads' with native Australian ingredients. These products are promoted for their enhanced nutritional profile, but to date do not constitute a significant proportion of the market, possibly due to small-scale production and premium prices.

Convenience:

Convenience has emerged as a critical factor determining product acceptance, which reflects increasing consumer demand for portable, single portion, easy-to-prepare meal solutions, and easy to use packages. This is due to changing eating habits and busy lifestyles, where the pressures on time availability has resulted in increased on-the-go consumption.

The trend towards more convenience products and out-of-home dining is a pattern affecting all western industrialised countries, prompting a shift in the purchase of baked goods, with loaf bread declining.

Fresh and natural:

The trend to buy fresh and natural products supports the growth of hot bread shops. The growth of supermarket in-store bakeries is also consistent with the trend to fresh and natural. Many people perceive bread baked by a small baker to be less processed and to contain fewer additives than packaged bread sold in a supermarket.

There is also a strong correlation between consumers' perceptions of 'natural fresh' products, which are believed to be less processed, and the increase in non-proprietary white breads.

Market segmentation, diversification:

There is a developing trend towards product segmentation, leading to a growing number of products targeting specific consumer groups such as children; each targeted product seeks to offer precise product attributes (e.g. convenience, indulgence, novelty, health) to clearly defined consumer groups.

Bread manufacturers have different production capabilities and therefore respond differently to consumer needs than do smaller bakers. Larger bakers are restricted to producing products in larger quantity, but through their R&D capabilities are able to drive the development of innovative products. Smaller bakers and hot bread shops are better positioned to produce a greater variety of products, and in doing so, are challenging the market share of the major plant bakeries.

Recent years have seen industry participants invest considerable resources in branding their products within particular segments (e. Tip Top in the health category). High-profile brands also often extend the life-cycle of products, resulting in higher sales.

Substitutes:

There has been a large increase in the number of competitor foods, especially in the snack food category, but also including other carbohydrates such as breakfast cereals, rice and pasta.

Price/Margins:

Traditionally, price has been the most important basis of competition since bread products have long been regarded as staple items and thus have not generated much interest from consumers. Price continues to be a major basis of competition, although greater marketing efforts by the industry has increased the importance of non-price competition.

High commodity costs, increasing retailer power and consolidation amongst top players are putting pressure on margins. Retailers have forced manufacturers to reduce prices, shrinking margins at a time when companies are already spending higher amounts on ingredients.

To counter price discounting in key categories such as bread, manufacturer have and are developing new varieties of value-added products that attract premium prices, such as organic goods, breads and biscuits enriched with vitamins.

Taste, pleasure, quality:

Consumers increasingly seek indulgent products such as luxury, gourmet and exotic products which offer superior taste experience and are usually rich in fat and calories.

Consumers are prepared to pay a premium for guilt-free indulgence.

2.3 CASE STUDY: FUNCTIONAL BREAD

The 'functional' bread market (which is fortified with nutritional ingredients such as Omega-3) is analysed internationally as a value-added bakery product to establish trends and learning. In general, although this market is small in many developed countries, the market is well developed in Australia.

INTERNATIONAL MARKET:

Although value-added food products in developed countries (such as in Europe and the USA) is increasing and large (particularly for beverages such as dairy in the functional food sector), functional bakery products, including bread, are generally a small niche

market. Internationally, functional foods are difficult to launch successfully (e.g. snacks) unless they have a healthy image on which to build (e.g. dairy).

Bread shows more potential than other bakery products when it comes to the functional food sector, not least because it is generally regarded as a healthy product (particularly breads such as wholemeal and mixed grain). However, growth in the functional bread sector has been weak, exacerbated by the fact that marketing efforts to communicate the product's benefits to consumers were only minimal at best. Sales of functional bread is generally between 4 and 6% of bread sales; in Germany, for example, in 2008, total bread consumption was 57.5 kg per capita, while functional bread was about 200g.

In Germany, even though functional bread (such as omega 3 bread) is a small market, it has seen good growth rates. As wholemeal bread is very common in Germany, Germans are well aware of the fact that bread with high fibre content is good for digestion and intestinal health. This awareness is a good base for positioning functional products in the bakery sector, although it also restricts the market because of the acceptability of alternative breads.

In the UK, functional bread is a small market (total bakery is about 3% of functional foods, and bread is a small part of this). There has been less innovation within bakery, less consumer acceptance, as consumers struggle to associate products such as confectionary and biscuits with healthy eating. The addition of functional ingredients is not as easily accepted for products that are more strongly associated with indulgence rather than health, as it is for products that have a healthy image; this is particularly the case where marketing efforts to communicate the health benefits have been minimal.

AUSTRALIAN MARKET:

Bread consumption in Australia has increased by 20 per cent since 1988. Increasing consumer interest in health has had an effect on the types and varieties of breads available. Wholemeal and mixed grain breads have not increased in sales – instead 'functional' white breads are driving the nutritional aspect of the bread market with growth of 10 to 15% annually.

Leading industry players like George Western Foods have been the first to take advantage of the developing functional breads market. GWF's Tip Top Up range has captured 12% of the total bread market since its release in 2002.

Fortunately for the functional food industry in Australia, the mainstream media have been platforms on which the importance of including general nutraceuticals and other fortified foods in consumer's diet has been underlined repeatedly.

An interview with the technical/Innovation director of a major bread manufacturer in Australia by the author of this report emphasised the following:

- Innovation in the bread industry in Australia (including fortified and functional bread) has reinforced the 'traditional appeal' of bread
- Functional bread has created new users, but also fragmented the market
- The growth and size of the functional bread market in Australia is better in general than other countries mainly due to the good understanding and acceptance of the benefits of nutritional ingredients such as Omega 3 and fibre, supported by R&D, branding, and communication.

TRENDS:

The largest trend affecting the food market is functional products promoted as 'good for health'. The demand for functional foods in general has increased with the ageing baby boomer population, rising healthcare costs, and the rising incidence of lifestyle disorders such as obesity.

This trend has led to the growth of functional and fortified bread, particularly as consumers have been educated in the importance of nutritional ingredients such as Omega-3. In Australia, over two-thirds of consumers report that they are now aware of Omega-3 fatty acids, and over a third routinely consume products with Omega-3. The result is an average annual increase in the Omega-3 product market of over 30% since 2000.

Consumers also want products that offer convenience and flexibility, products that taste good and that can be easily integrated into foods that are already a regular part of their diet, and are cost-effective. Many products that have added Omega-3 internationally have often struggled to gain a strong market share, with one of the notable exceptions being Tip-Top Omega-3 bread in Australia.

Of all of the bakery products, bread provides the most ideal food to deliver functionality. Bread's low cost and commonality makes it an excellent vehicle for nutrients; because enriched bread is typically consumed as part of a greater meal its added nutrients are better absorbed.

In developing functional bakery products (including bread), it is important to note that achieving functional food quality does not only involve delivering the active component at the appropriate level for physiological effectiveness, but also supplying a product which meets the consumer's requirements in terms of appearance, taste and texture. Producing the right product is only the beginning- consumers need to be convinced that taste isn't compromised; otherwise they will remain reluctant to purchase these products.

3. CONCLUSIONS AND LEARNINGS

The major conclusions from the analysis of the international and Australian value-added wheat sectors are as follows:

- Y Value-added products need to be differentiated from competitive products and supported by above average levels of marketing, R&D and innovation investment (including scientific and clinical trials as required). Despite this, products can fail if they are introduced late into the market where competitive products already exist, and where problems (such as high price, and poor quality) exist. For specialist ingredients, there is a need to focus on specific applications where the products exceed the performance of substitutes, and create barriers to entry.
- Y Although the overall wheat-based sector is largely static, there are areas of growth; in particular wheat-based products are increasing in the developing world as diets reflect western preferences, and bread is now growing in Australia following decades of decline in consumption per person, fuelled by value-added breads such as speciality and functional breads, and a greater variety.
- Y The increase in value-added bread has been driven by increased R&D/innovation, changes in consumption in the developing world, the changing ethnic structure of consumers leading to greater variety and segmentation, the growing concentration and growth of supermarkets, awareness of health/wellness/nutrition, growing desire for convenience and fresh and natural products, and the desire for taste and pleasure. In addition, sales are affected by price, and the availability of substitutes (such as alternative carbohydrates).
- Y Functional bread is a small niche market internationally, and has largely failed to capture market share. The reasons for this are an underinvestment in R&D/innovation, poor communication to and education of consumers on their health benefits where many baked products are perceived to be an indulgence with high fat, and premium prices. However, in Australia, functional bread has been successful. The main reasons for this are: new users were created because of the good understanding and acceptance of the benefits of nutritional ingredients such as Omega-3 and fibre, due to a sustained media campaign by both government, and public and private sector stakeholders; a high level of R&D and innovation, supported by branding and promotional support; bread (particularly wholemeal and mixed grains) is generally perceived to be healthy, and provides a base for the launch of functional products.

Has the core product influenced and been influenced by the perceptions of value-added products, such as health attributes?

- Internationally, functional foods are difficult to launch successfully (e.g. snacks) unless they have a healthy image on which to build.
- For bread, the functional market is much smaller than dairy due to the mixed image of bread as a healthy product, with wholemeal/ multi-grain/ mixed grain bread generally regarded as very good, and white bread rated poorer for health and nutritional value.
- Of all of the bakery products, bread provides the most ideal food to deliver functionality. Bread's low cost and commonality makes it an excellent vehicle for nutrients; because enriched bread is typically consumed as part of a greater meal its added nutrients are better absorbed.

- In general there has been less innovation within bakery and less consumer acceptance, as consumers struggle to associate products such as confectionary and biscuits with healthy eating. The addition of functional ingredients is not as easily accepted for products that are more strongly associated with indulgence rather than health, as it is for products that have a healthy image; this is particularly the case where marketing efforts to communicate the health benefits have been minimal.

What are the conditions for success in developing and launching value-added products?

- It is recognised by the dairy industry that they must educate consumers to make changes to their eating habits and their lifestyles. Fortunately for the functional food industry in Australia, the mainstream media have been platforms on which the importance of including general nutraceuticals and other fortified foods in diets has been underlined repeatedly.
- The technical/Innovation director of a major bread manufacturer in Australia emphasised the following: Innovation in the bread industry in Australia (including fortified and functional bread) has reinforced the 'traditional appeal' of bread; The growth and size of the functional bread market in Australia is better in general than other countries mainly due to the good understanding and acceptance of the benefits of nutritional ingredients such as Omega 3 and fibre, supported by R&D, branding, and communication.
- In addition to health, consumers also want products that offer convenience and flexibility, products that taste good that can be easily integrated into foods that are already a regular part of their diet, that taste good, and are cost-effective. In developing functional bakery products (including bread), achieving functional food quality does not only involve delivering the active component at the appropriate level for physiological effectiveness, but also supplying a product which meets the consumer's requirements in terms of appearance, taste and texture.
- The CEO of the Gardiner Foundation emphasised the following: require very detailed market information; for example, if exporting to China, need to establish which provinces to enter, with detailed demographic data; Australia does not generally sell its own branded products abroad, but relies on partners to incorporate the products into their brands (e.g. Skim Milk Powder into ice cream). It is thus necessary to develop appropriate partners and provide technical support; value-addition requires major investment in R&D, with a focus beyond the dairy sector e.g. incorporating dairy into noodles to increase lysine content, incorporating dairy into processed meat to improve gelling and water retention.

Are there failures which provide insight and learning?

- Both Murray Goulburn, as well as Fonterra have had failures with value-added dairy products. The lessons from these failures is as follows: the price must reflect value-for-money; the product must meet consumers taste and quality requirements and be practical to use; the products need to be differentiated from competitive products and supported by above average

levels of marketing, R&D and innovation investment (including scientific and clinical trials as required).

- Value-added products shield dairy companies when commodity prices are low, but add complexity to production and logistics, particularly if they are specialised and are low volumes. Sometimes it makes sense to have a separate organisation to focus on complex and niche value-added products, such as the Nutritionals Business Unit in Murray Goulburn.
- Internationally, growth in the functional bread sector has been weak; this is mainly due to: an underinvestment in R&D/innovation; poor communication to and education of consumers on their health benefits where many baked products are perceived to be an indulgence with high fat and premium prices.

Were difficulties encountered by the companies in "selling" the idea of value added products? How would companies change the way they sold the idea internally if they could have the time over?

- In many cases, the launch of value-added dairy and bread-based products has fragmented the market and created a profusion of 'similar' products. Within this context, one dairy company changed minds externally through effective communication (using opinion leaders, sports people, health professionals, science/research results). Internally, there is ongoing debate between R&D/Innovation, Operations/Manufacturing, and Sales/Marketing about the appropriate mix of core and value-added products; the main arguments used for value addition are: that additional margins are available from value-addition (e.g. spray-drying whey as a protein product); use of waste and contribution to environmental goals; and the fact that value-addition in dairy is relatively easy (no major capital, easy to add ingredients/flavours).
- A different argument is needed with the CEO, Operations, Marketing (but key that this is led by CEO). For the CEO, the key argument for value-addition is that higher prices are obtained, which 'shield' the company when commodity prices are low. For Operations, complexity and disruption must be minimised through good technical/engineering support, improved processes, produce less waste or take out valuable ingredients from waste, and indicate that value-added products are steady and become routine in contrast to commodities which vary in supply. For Marketing, the key discussion is that value-added products are growing, have higher margins, and meet consumer's needs; also value-added products are an opportunity to build relationships with major companies/ key customers such as Nestle and Kraft.

How was market cannibalisation prevented or dealt with by management?

- Dairy industry experience indicates that milk and value-added variants do not cannibalise each other, but generally grow the total market and consumption. The product used changes with the family life-cycle (older empty nesters will buy low fat or functional milk, family with young children will buy core product, teenagers may want flavoured milk etc). In addition,

milk products are versatile and can be used for multiple dietary uses (milk for cereals, and coffee). An example of a value-added variant growing the total market was the launch of shredded cheese which has found new uses (e.g. for pizza bases).

- In the bread market, the launch of value-added variants affected the sales of white bread, but also reversed the decline in the overall bread market in Australia (with higher prices obtained from functional breads).

The report has also identified drivers for value-addition for dairy and wheat-based products. These can be summarised as follows:

WHEAT	DAIRY
<i>Economic conditions, price, growth; growth in developing countries, westernisation, income growth, population growth, urbanisation</i>	<i>Westernisation of diets in the developing world (particularly in Asia); Changes in consumption patterns</i>
<i>Substitutes</i>	<i>Substitutes</i>
<i>Consumer needs: health/nutrition/wellness, convenience</i>	<i>Health, wellness, and nutrition; Convenience; Fresh and natural; Taste, pleasure, quality</i>
<i>Science and technology/Innovation: New Product Development, new applications</i>	<i>Innovation, science and technology</i>
<i>Government regulation</i>	
<i>Need for efficiency and margins: diversification, new products, markets, higher prices, capacity utilisation</i>	<i>Market segmentation, diversification</i>
<i>Retailers</i>	<i>Retailers</i>

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