CONSUMER NEEDS WILL SHAPE FOOD AND WOOL PRODUCTION

C. MALLETT

CSIRO North Ryde Laboratories, North Ryde, N.S.W. 2113

INTRODUCTION

This paper emphasises the effects of consumer needs not only on future food production but also on the animal-derived food and wool industries.

THE CHALLENGES OF CHANGE

Relatively recent events in eastern Europe and the USSR, the reunification of Germany, the Gulf conflict and continuing instability in the Middle East region have all influenced the way we live.

Closer to home, the rapid economic growth of our Asian neighbours, with increased trade liberalisation and higher disposable incomes, is fuelling more consumer demand there for items previously considered luxuries, including food and fibre derived from animals.

As well as consuming more food overall, Asian food consumption patterns are changing rapidly. Asians are eating more protein and animal fat, more cereal and cereal-based products, more processed and convenience foods, more fresh fruit and vegetables and more functional foods (PMSEC 1994).

However, these expanded Asian markets are not necessarily assured markets for Australian animal-derived food and fibre producers. In addition to competition from other countries, increased concern for the environment, greater interest in health and nutrition, and changing consumer preferences leave no room for industry complacency.

The key challenges to be faced by Australia’s animal-derived food and fibre industries are to provide the “clean, green” products that domestic and overseas consumers want, and at the right price.

FOOD IN 2020

In order to see how consumer need will affect animal-derived foods, it is useful to consider the possible nature of the food industry in the year 2020 (Mallett 1994).

Background

The rate of fundamental technological change in the food industry is relatively slow compared to other industry sectors, owing to the conservatism of the eating public. The pace of change is driven by consumers, as they are always the ultimate arbiter of the success of any new food product, irrespective of slick advertising, aggressive pricing, or ‘space-age’ technology.

While discoveries and new knowledge open up new possibilities, and invention allows us to take advantage of them, it is changes in our values that determine which social trends, the principal drivers of change, we will follow and thus create the opportunities and demand for particular food technologies. For the most part, demographic changes are relatively slow moving and can be anticipated, while economic factors tend to affect the speed of change, rather than drive it.

Trends

The trends that will shape the food industry by 2020, and the business opportunities they will generate, together with their enabling technologies, are shown in Table 1.

Although the detailed implications of these trends will vary across an industry as large and diverse as the food industry, the major implication is the desire for healthy, interesting fresh food. The trend for freshness, reflecting a return to an unpolluted Arcadia without the pressures of urban living, will mesh with the desire to lead a healthy lifestyle. Concern will continue, not only about the quality of our external environment, but in particular about our ‘internal’ environment, as “you are what you eat”.

The most significant change will be the proactive use of foods to promote health as scientific research will have uncovered the role of diet in diseases. This change in diet will involve increased consumption of fruit, vegetables, and low-fat, low-sugar, low-salt products, and reduced consumption of fattier, sweeter products.
Table 1. Social and demographic trends that have influenced the business opportunities with the technologies that made them possible

<table>
<thead>
<tr>
<th>Trend</th>
<th>Opportunity</th>
<th>Technology to realise opportunity</th>
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<tbody>
<tr>
<td>Social trends</td>
<td></td>
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<tr>
<td>Increasing freedom and liberation of the individual</td>
<td>Convenience</td>
<td>Increased use of ‘clever’ appliances, e.g. microwave ovens</td>
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<td>- more working women</td>
<td>Food service</td>
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<tr>
<td>- less time spent in kitchen</td>
<td>- Prepared foods (meals, meats, vegetables/salads)</td>
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<tr>
<td>Autonomy in the family</td>
<td>- more eating out</td>
<td></td>
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<tr>
<td>- fewer family meals</td>
<td>Convenience, variety, smaller portion packs and snacks</td>
<td>Flexible manufacture</td>
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<tr>
<td>- more self-preparation</td>
<td></td>
<td></td>
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<tr>
<td>- ‘grazing’</td>
<td></td>
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<tr>
<td>Health, fitness, wellbeing</td>
<td>‘Healthy foods’ rather than healthy diets</td>
<td>Use of biotechnology to enhance nutrition</td>
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<td>- calorie control</td>
<td>‘Functional’ foods</td>
<td>Minimal processing routes to conserve nutritional status</td>
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<tr>
<td>- low fat, low salt, low sugar diets</td>
<td>- More ‘natural’ foods without additives or contaminants (pesticides)</td>
<td>Chill distribution chain to allow removal of preservatives</td>
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<td>- healthy lifestyle and concern over the environment</td>
<td>- Fresh is best, chill is good</td>
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<tr>
<td>- concern over food quality</td>
<td>- ‘Less’ packaging</td>
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<tr>
<td>Increased acceptance of change</td>
<td>New products and cuisines</td>
<td>Recipe development</td>
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<td>Demographic Trends</td>
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<tr>
<td>Ageing population</td>
<td>Newer, healthier, quality foods in smaller portions</td>
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<tr>
<td>Smaller families</td>
<td>Better quality products</td>
<td></td>
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<tr>
<td>Economic Trends</td>
<td>Luxury brands</td>
<td>Low cost manufacture</td>
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<tr>
<td>Polarisation of wealth</td>
<td>Economy labels</td>
<td></td>
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<tr>
<td>Rising affluence/urbanisation in Asia Pacific region</td>
<td>Westernisation of eating habits</td>
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Food products

There will be a very wide range of foods available in 2020 to cater for the tastes of particular groups of consumers, but the shelf space allocations in the supermarkets will have changed radically, with a focus on fresh and chill produce. These changes are best understood in the context of food types, namely:

- Naturally structured foods, which are derived wholly, with little processing, from naturally intrinsically edible raw materials such as meat, fish, fruit and vegetables. In this group of foods, consumers will expect products to be fresh, or as close to fresh as possible, with minimal processing. This will lead to a clear preference in food preservation for chilling over freezing, followed by canning and then drying.
- Foods prepared from specific raw material, whose character depends largely on their original composition, has led to very specific manufacturing processes such as cereal and bakery products, beverages (tea and coffee) and dairy products such as cheese.
- Fabricated foods such as margarine, chocolate, sauces, mayonnaise, ice cream, which are assembled from well-characterised and specified ingredients. There is thus considerable latitude for process manipulation. Within the category of naturally structured foods, fresh fruit and vegetable consumption will be high, not only because of the quality of the produce but also because of their prophylactic properties for acute diseases (cancer, heart disease) and chronic diseases (arthritis). These properties are due to the natural antioxidants within horticultural products, and detailing the genetic mechanism of their action will be one of the future triumphs.
of nutritional science. Building on this microstructural understanding, biotechnology will be used to enhance the level of desirable nutrients, as well as to enhance flavour and texture.

Owing to the continuing drive for convenience and variety, there will be a cornucopia of new varieties, such as tropical fruits, and new cultivars such as salad produce, often in ready-to-serve formats like pre-cut salads. Chill food will be the largest individual sector in the food store in Australia and South East Asia generally. The majority of products will be convenience foods (e.g., pizza, ready meals catering for local tastes) and their safety will depend critically on the total control of the supply chain, from raw materials to distribution.

In the fresh meat sector in Australia, there will be an increase in white meat consumption, especially chicken and seafood, for nutritional reasons. The change, however, will not be as emphatic as in the Northern Hemisphere owing to our culture and because red meat is much cheaper here. There will also be a significant increase in intermittent vegetarianism, that is people who eat less meat, either white or red. Despite these trends in Australia, the economically vital beef export industry will have flourished, owing to strong demand from an increasingly affluent South East Asia happy to flaunt its recent-found wealth.

**Developments in the food supply chain**

There will be significant innovations in each of the constituent parts of the supply chain by 2020 (Figure 2).

![Figure 2 - The food supply chain](image)

**Raw materials and ingredients**

Most ingredients and part-processed raw materials will be derived either from physical or biotechnological processing of foods and thus will be ‘natural’ for consumers. The precision with which ingredients can be made will allow a focus on the functionality of a constituent in a particular system. For instance, many stabilisers will be produced from plant cell cultures, while starter cultures for dairy products such as cheese and yoghurt will have been genetically modified to produce new flavours and textures, as well as to be resistant to bacteriophages.

In these applications, as elsewhere, the use of biotechnology will be driven primarily by the need to provide quality attributes rather than simply the possibility of improving yields and reducing price. However, the innate conservatism of consumers for ‘new’ materials is likely to be reflected in the lack of radically new raw materials and the relatively low penetration of meat substitutes.

These developments will be accompanied by the introduction of environmental sustainability as a major requirement in the expansion of Australia’s role as a ‘green’ source of raw food materials and ingredients for overseas markets.

**Food processing**

With the developments in information technology and information processing making possible a radical change in the logistics of food distribution, consumers will be able to define fresh produce as their benchmark for food quality.

The principal focus in food processing will be to remove processing steps, or to introduce new steps, to provide foods that are as close as possible to fresh while maintaining a perfectly ‘clean’ product for human consumption. To achieve this end, the emphasis in process technology will be switched from the product and various techniques to inhibit or inactivate the growth of pathogenic and spoilage flora, to product packaging and control of the supply chain.

One of the more radical changes to industry structure will be the development of on-farm processing to capture the freshest produce and to improve yields. New control technologies coupled with miniaturisation will have allowed the development of harvesters that also process and pack, and so replace factories as, for instance, is the case for vegetables such as peas, sweetcorn and tomatoes.

**Food packaging**

Environmental pressure on the packaging industry will result in highly sophisticated ‘minimal’ packaging systems, developed through computer-aided design. Simple paper and plastic packaging will be supplanted in part by genuinely biodegradable materials, based on starches, which are composted by the user. Packaging will also be used to assist in food preservation, with systems to absorb various gases (e.g., oxygen and ethylene), to
release gases (carbon dioxide), or to release bacteriocins, often through biologically-based, rather than chemically-based, systems.

**Food retailing**

Retailing in 2020 will be revolutionised as much through information technology as by technologies along other parts of the supply chain. The most obvious change will be the increase in home delivery, with customers selecting their requirements through terminals at home from a catalogue of products, and having the order picked up at a warehouse for rapid home delivery. For most people, this development is restricted primarily to traditional grocery items, though the busiest consumers buy all their goods this way.

**The consumer kitchen**

Kitchen design changes will be driven by the need for convenience and ease of use for all family members. Appliances will have become more ‘intelligent’ with special areas within refrigerators for the different requirements of chill food, and with microwaves that cook products from instructions read in from a barcode on the food pack. Integrated systems will start to be introduced, where different ready-to-use products are stored in various locations within the refrigerator and automatically retrieved and cooked in a microwave from a computer-logged menu in the combined system.

**Beyond the consumer kitchen**

The food service sector will have grown to match the value of the supermarket sector as more and more people eat away from home or pick up take-away meals. Increased demand will have not only spawned a great variety of different eating formats and styles, but led to the growth of suppliers dedicated solely to providing prepared food for food service outlets to increase consistency and safety as well as improve productivity at the outlet. Many of these operations are natural developments from the airline catering services of the past, though some retail chains have chosen to vertically integrate their operations.

**Food quality**

The quality of food has been previously highlighted and it is considered in more detail because of the continuing need for animal-derived food producers to pay paramount attention to it in their production systems.

**Safety**

Quality food requires, as an absolute “non negotiable” minimum, that it is safe to eat and so free of microbial contaminants and chemical residues, derived from natural and applied sources.

Consumer taste and nutritional preferences are the second key dimension to quality. Food is enjoyable to eat as well as being a basic necessity. As incomes rise, consumers increasingly demand quality attributes associated with taste, nutrition, healthiness, freshness and convenience.

While microbial contamination of food poses the greatest potential for risk to human health, residue incidents are rarely a serious health issue, though they are a serious trade issue.

Delivering safe food to the consumer will be achieved by:

- continuously improved quality assurance (QA) systems (from paddock/pond to plate);
- reduced use of chemicals for disease and pest control, and growth promotion; and
- sophisticated QA systems along the entire food chain.

**Quality assurance**

Traditional quality control (QC) approaches, usually based on end point inspection, will have long been discarded by 2020 because they cannot by themselves deliver clean, safe food. QA approaches, based on sophisticated Hazard Analysis Critical Control Points (HACCP), will ensure that all potential food hazards are identified in a process or handling procedure and that preventative strategies are developed and implemented to ensure these microbial and chemical residue hazards do not end up in the product offered for sale.

The current Australian Lot Feeders’ Association Feedlot Accreditation Scheme, the Cattle Council’s Cattlecare Programme and relevant sheep, lamb and pig meat, and aquaculture QA programmes will have long been superseded by more sophisticated QA programmes. Further, the dairy industry with its current well established systems of quality and safety controls along the production and processing chain will have given the lead nationally in QA. Thus, two recent incidents will be most unlikely to be repeated in future; ie, the chlofluazuron residues in beef that followed the eating by cattle of contaminated cotton trash in Queensland and New South Wales, and the serious poisonings caused by *E. coli* contamination of South Australian mettwurst.

Properly designed, implemented and certified QA systems will also deliver a consistent, reliable product to consumers that meets their requirements by ensuring that potential food hazards are identified and then...
controlled through appropriate monitoring and corrective management. Commercial incentives, including preferred supplier status and/or price premiums, will entice producers to adopt certified QA systems.

**Organoleptic quality**

Other quality attributes such as taste, colour, nutrition, freshness, packaging etc, are also important to attracting and sustaining customer attention and repeat purchases.

The meat industries will have long described their products to consumers so that eating quality is not a matter of “pot luck” but is easily identified at the time of purchase. Quality grading systems will have simplified the buying decision, and the transmission of market signals from plate back to gate.

**Impact of biotechnology**

Biotechnology will have a major impact on the quality of animal-derived food and fibre products. The major initial application of biotechnology will be in developing and using new vaccines which will protect livestock against disease and plant poisoning, and control pests such as ticks, lice and sheep blowfly. These measures will reduce the use of chemical control methods for pests and so minimise contamination by chemical residues of animal-derived products. Vaccines will also be developed that will enable livestock to grow more efficiently and to economically produce meat, milk and fibre products of the desired quality and specification.

As well as vaccines, traditional approaches to animal breeding will be coupled with new molecular techniques for genetic selection and transgenic approaches. Marker-assisted selection and embryo technologies will bring the generation interval of large domestic livestock to equal that of plant crops. Sex manipulation in livestock will also become a practical reality and female livestock will be produced to order. Further, beef cattle will be selected by molecular markers for meat quality traits.

These new biotechnology approaches will vastly improve genetic management of the livestock resource. Improvements in reproductive technologies will allow breeding from fewer animals of the right type for their environment. Improvements in physiological technologies will enable rumen bacteria to be modified to improve the digestion and utilisation of fibrous forage and animals with these bacteria will have significantly increased ability to digest and utilise feed. More and better product will be produced from fewer animals and with more ecological sustainability (Jennings 1994).

**Overall assessment**

The food industry of the next century will be significantly different from now. In particular, the demand for fresh, minimally processed quality food, free of additives, in sophisticated biodegradable packaging, is likely to lead to radical advances in the logistics of the supply chain.

This will embrace new materials, in some cases biotechnologically altered to enhance their taste and nutrition, ‘intelligent’ packaging designed to maintain freshness, and sophisticated information technology to allow just-in-time food production.

**Wool**

*General*

Over the last decade wool prices have fluctuated widely and generally declined. Major factors have been worldwide recession, declining proportions of personal income spent on textiles, withdrawal of major customers (China and Eastern Europe) from the markets and the disposal of the wool stockpile.

The first two factors apply to all textile materials and suggest increasing competition with substitute fibres through to 2020. These long term trends point to the need for demand building through creative product development and promotion to maintain market share. This can only be achieved by a focus on the top end of the apparel market as the percentage of the total fabric market occupied by wool continues to decline.

The last two factors, reduced purchases by major customers and disposal of the wool stockpile, are of a shorter term nature and, despite the current situation, the outlook in the medium term is positive although terms of trade will continue to decline.

*Clothing trends*

The major markets for wool clothing in Europe, North America and Japan will remain but there are also very substantial opportunities in China and other Asian countries for increasing domestic consumption. It is important to note that in these countries the trend is towards conservative western styles of clothing where wool holds a particularly strong position. This greatly simplifies strategic planning by the elements of the entire wool pipeline.

In the future, wool product development must move much more rapidly in response to the market trends if it is to maintain its position. The trend toward lightweight, soft fabrics with easy care characteristics and the
ability to retain appearance is well established and has been evident for more than 20 years but the wool industry, although aware of these trends, has been slow to adapt to them.

The wool grower focus on pure wool products and reluctance to accept “value added blends” that create desirable new performance characteristics and also reduce the cost of processing, has allowed other fabric manufacturers to develop products that meet customer requirements at a lower cost and yet, in special instances, to command a price premium over pure wool garments. Major wool manufacturers have proceeded to develop the required wool products despite traditional views of the wool growing industry.

The perception that consumers associate “easy care” with cheap synthetics has led to a wool-grower lack of interest in easy care characteristics for wool apparel especially if it involved blending with other fibres. In the last few years the industry’s position has changed but wool is now at a disadvantage that will become more severe with time if not addressed.

Wool’s position in traditional apparel is strong but clothing styles and future designs are changing. Last year, for example, sales of business suits in the USA plunged 23% as corporations adopted more casual dress codes, starting with “Dress Down Friday”, “Multi Day”, “Casual Friday”.

New products

The long term future of wool production in Australia depends ultimately on the placement of “clean, green” wool products that attract consumers in the market place; this will require the integration of innovative product technology, creative product development and skilled marketing. It will also require greater productivity and improved quality throughout the wool pipeline from farm to fashion, and more value adding to wool in Australia.

Consumer perceptions of new wool product value are a key element to address in identifying ways to stimulate consumer demand. Two factors of importance to the perception of the value of wool products are function and aesthetics. However, these two factors are currently the basis of vigorous competition among fibre producers and recent initiatives in non-wool products include softness with machine wash and easy-care performance.

PERCEPTIONS INFLUENCING CONSUMER DEMAND

There are a number of consumer perceptions that are capable of influencing consumer demand. They include:

Environmental aspects

Local and overseas consumers are increasingly demanding an emphasis in the rural sector on sustainable production systems, with minimisation of pollution and environmental degradation. Australia’s record as a ‘green’ animal-derived food producer will need to be sustained.

Animal welfare

Animal welfare activists, here and overseas, are capable of influencing consumer perceptions about the humaneness of Australia’s domesticated livestock husbandry, transport and slaughter operations. This has the potential to reduce demand for meat or fibre and/or result in increasing regulation of the entry of such products to overseas markets.

European activists have also been concerned with Australia’s control measures for feral introduced wildlife and native wildlife. There is the potential for this concern to be reflected in antipathy to the consumption of Australian foods, particularly red meat, and for antipathy also to be directed to animal fibre use as well as the live sheep export trade.

Animal health status

Profound changes are taking place in international trade in animal products. Globalisation of trade arising from the GATT negotiations, the formation of the World Trade Organisation and demands for harmonisation of trade restrictions disease and residue status or risk are major considerations. There will be increased demand for disease (and residue) monitoring for quality assurances and certification of imported and exported livestock and aquatic animal products.

The UK beef industry has been profoundly affected by the UK Government announcement that there may be a link between Bovine Spongiform Encephalopathy (BSE) in cattle and Creutzfeldt-Jacob disease (CJD) in humans. While the dangers of eating UK beef are probably very low, there is no evidence to say how low at this time.
Pending the development of a reliable test(s) for BSE, the UK public is likely to continue to take the view that the risk of eating beef, and possibly other meats, is not worth taking and so the UK beef industry faces a bleak future. There are lessons for Australia and the Government has already moved to prohibit the feeding to ruminants of meals containing rendered ruminant materials, though excluding milk or milk products, tallow or gelatin.

In passing, it should be noted that the animal welfare implications of BSE do not appear to have been debated in UK media reports, nor has the prospect of a prolonged mass slaughter of actual and likely BSE-affected animals. The television impact of such a cull would be profound and possibly lead many to embrace vegetarianism.

Conclusion

While "the customer is always right" cliche may well be a little tired through overuse, it nevertheless remains a truism that should not be ignored. Animal-derived food and fibre customers are demanding and getting improved products, and an emphasis on their wants, not necessarily the same as their needs, yields impressive results.

At Outlook '96 Mr Reg Clairs of Woolworths Ltd noted that “in the mid-1980s we (Woolworths) were on the brink of disaster. Our profits had plummeted to zero, customers deserted us as our shelves were not fully stocked, the service was poor and generally we had lost direction...in 1986 we created a Vision...To be recognised as the dominant food retailer in Australia, because of our relentless focus on customers, fresh foods, superior value, and a dominant grocery offer...ten years later, with that Vision shared by our 80 odd thousand employees we have achieved our goal...”

Woolworths’ deserved success carries a clear message for all animal-derived food and fibre producers, and the industry bodies that represent them; ie, ignore the consumer at your own peril!

REFERENCES


