CURRENT ISSUES AND FUTURE TRENDS – G4

Eco-efficiency resources for the food processing industry

Prepare for the future

The food processing industry is changing. The eating habits of many people have slowly moved from home cooked meals to more convenient 'ready-to-eat' and 'heat-and-eat' meals. There is also a push by consumers to 'healthier' foods with less processing and more fortification with supplements.[1] There are changes to the food processing industry through global access to food chains with the ability to retain freshness longer through actions such as snap freezing and refrigeration. This fact sheet outlines several current issues and potential future trends for the food processing industry.

Impact of climate change

Climate change has the potential to impact the food industry in many ways. Changes to weather patterns may alter the areas suitable for growing food and crop yields. Government mandates to reduce greenhouse gas emissions are likely to influence the means of production, transport and storage of goods.

A reduction in the availability of water may have a three fold impact on the food processing industry. The amount of water available to companies may be regulated and reduced below their requirements, forcing companies to investigate alternative sources such as internal recycling, rainwater, bores or taking excess from other companies. This could potentially lead to concerns for food safety and a public perception that food made using recycled water is less valuable than food manufactured using non-recycled water, affecting the sales for a company.

A second impact from reduced water availability could be on energy supply. Traditional large power stations rely on water as a major component in energy generation. If less water is available then the energy supply becomes less secure unless alternatives are sought. The impact of the Carbon Pollution Reduction Scheme (CPRS) and increased supply scarcity is likely to significantly increase energy prices, increasing operating costs for food processors.

Thirdly, a reduction in available water will impact crop yields and raw material availability and cost. The impact of drought on raw material availability was evident in 2007 with the low production of crops such as cotton, rice and wheat. It also resulted in increased prices of dairy products due to water shortages on dairy farms. This impacted on food processors using dairy products such as milk and butter as raw ingredients. They paid higher prices for these raw ingredients, reducing profit margins.

Some of the ways in which climate change may impact on the food processing industry are listed below.

- Changes to agricultural methods altering quality, quantity, variation and overall availability.
- Reduction in availability of resources and increase in costs of resources such as water and energy, either due to lack of supply or through governmental intervention.

[1] *European Technology Platform on Food for Life, 2005, The vision for 2020 and beyond, etp.ciaa.be/asp/home/welcome.asp*

- Reduction in quality of resources for example the quality of water.
- Mandatory requirements to reduce greenhouse gas emissions and CPRS.

For more information visit: Food Science Australia – Adapting to Climate Change, www.foodscience.com.au/climate-change/index.htm
Food Climate Research Network, www.fcrn.org.uk

Resource efficiency management plans

Plans can provide assistance to companies as a method of identifying resource use and determining eco-efficiency opportunities with acceptable payback periods.

Due to the drought, Southeast Queensland food processing companies using over 10 ML of water per year and/or operating cooling towers must operate with Water Efficiency Management Plans (WEMPs) approved by their water service provider.

Similarly, companies consuming over 500 TJ (or 500,000 GJ) a year are currently required to report to the Australian Government through the Energy Efficiency Opportunities program. Queensland companies using between 100 TJ and 500 TJ of electricity and gas will be required to report under the Smart Energy Savings Program. This scheme will be extended to smaller energy users in the future (refer to the *Energy efficiency programs (E2)* factsheet for more information).

Future mandatory programs may be implemented to assist companies to reduce water, energy and waste. These programs could include using management plans, implementing actions with suitable payback periods and requiring companies to report to government annually on their progress. ecoBiz is a voluntary program that can assist companies in addressing these requirements prior to any mandatory implementation. For more information refer to *General overview (G1)* fact sheet.

For more information visit: for WEMPs visit Queensland Government Water, www.water.qld.gov.au
Energy Efficiency Opportunities, www.energyefficiencyopportunities.gov.au
Smart Energy Savings Program, Queensland Department of Environment and Resource Management, www.dme.qld.gov.au/Energy/smart_energy_savings_program_.cfm

Environmental management systems (EMS)

An EMS is a formal set of processes and practices that enable an organisation to systematically manage environmental issues. The EMS provides a framework for businesses to:

- consistently improve practices
- monitor progress towards defined objectives and targets
- respond appropriately to emergencies and environmental incidents
- train staff in environmental management.

This consistent approach allows companies to effectively keep track of their environmental issues and identify problems before they occur.

Many companies use an EMS as ‘insurance’ against unforeseen environmental problems. Corporate customers are also increasingly requiring suppliers to have formalised environmental management systems in place as a contract condition and a certified (ISO 14001) EMS is internationally recognised.

Furthermore, many environmental issues are often symptoms of other inefficient practices. Improving energy, water and raw material consumption as part of the implementation of an EMS can lead to environmental benefits as well as financial savings, often with short payback periods and low capital expenditure.

For more information visit: Australian Department of Environment, Water Heritage and the Arts, Environmental Management Systems,
www.environment.gov.au/settlements/industry/corporate/ems.html

Food miles

Food miles is a concept of classifying food depending on the distance and means of transport, from where it is produced to where it is consumed. The objective of the campaign is to allow consumers to make informed product choices based on perceived environmental benefit and also provide a distinction between local and imported goods. The concept of food miles is under development and there is considerable debate both for and against the food miles concept and its use in labelling.

The food miles concept is limited in that it does not take into consideration the environmental impact of growing the food. For example, a study by Lincoln University in New Zealand found that milk solids produced in the UK emitted 35 per cent more emissions per kg than that produced in a more energy efficient New Zealand-based facility, even after emissions from sea freight from New Zealand to the UK was included.[2]

FOOD MILES FOR LAMB PRODUCTION

Lamb raised in New Zealand and shipped to Britain actually produces less carbon emissions per tonne of product compared with locally raised lamb, due partly to the poorer quality pastures in Britain resulting in the need to grain feed the lambs. The energy used in growing, harvesting and transporting the grain considerably increases the greenhouse gases produced in raising lamb locally.[3]

A thorough life cycle assessment taking into consideration the growing, processing, transportation and consumption of the product is a more accurate means of assessing the environmental impact of food as opposed to the distance between producer and consumer.

For more information visit: Woodhouse, J. (ed) Food miles and food exporting, November 12, 2007 in Food Processing, www.foodprocessing.com.au/articles/1513-Food-miles-and-food-exporting

Virtual water

Similar to food miles and carbon footprints (refer to *Greenhouse gas emissions (E3)* fact sheet), virtual water is an environmental parameter used to measure the amount of water consumed through the life of a product, from production of raw material through manufacturing to consumption. For example, the production of 1kg of wheat requires 1,000 L of water.[4] It can be used to compare the environmental impact of different products through the amount of water required for production.

Life cycle assessment

Life cycle assessment (LCA) is a wide-ranging tool, broader than a carbon footprint or food miles, that considers impacts from all resource use (water, energy, raw materials and waste) and emissions on air, land and water. For example, it includes the toxic impact of fertiliser runoff into nearby creeks or contribution to localised smog from emissions generated in a certain location. It can be undertaken in accordance with the International Standards ISO 14040 (Environmental management – Life cycle assessment – Principles and framework) and ISO 14044 (Environmental management – Life cycle assessment – Requirements and guidelines).

For example, an LCA on an apple sauce product could take into consideration the loss of biodiversity of the area used to grow the apples as well as the impact of the fuel used to run farming equipment and the other inputs and environmental impacts. The LCA process is quite complex but does provide a comprehensive means to compare production or processing methods of different products. This will enable consumers and manufacturers to determine which has the least impact on the environment, for a range of parameters, over the whole product life cycle. LCA is also being developed to incorporate social and economic impacts.

Whilst LCA is used to consider all environmental impacts, the methodology can be used to simply analyse the greenhouse gas emission of a product or process. Depending on the chosen boundary, this would achieve the same objective as a carbon footprint.

For more information visit Australian Department of Environment, Water Heritage and the Arts, www.environment.gov.au/settlements/industry/corporate/lca.html

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[2] *Lincoln University, 27th July 2007, New 'food miles' report shows NZ dairying still more efficient than UK, greenhouse gases included, www.lincoln.ac.nz/story21175.html*

[3] *Lincoln University, 2007*

[4] *World Water Council, 2008, Virtual Water www.worldwatercouncil.org/index.php?id=866*

Food eco-labelling

Food labelling provides consumers with information on the contents of the food product. This concept is being expanded to include environmental information to assist consumer choice based on the product's environmental impacts. Currently this is a voluntary scheme used by companies to outline the environmental benefits of their products.

As consumers demand more information on the sustainability of the products they purchase, it is likely that eco-labelling will become more widespread to assist these choices. Currently, manufacturers can include declarations and labels on products, however these labels can be misleading to the consumers as many are not independently verified.

Schemes that independently certify that efforts have been made to reduce the environmental impact throughout the life cycle of products provide the consumer with confidence that the labelling is accurate. This life cycle assessment requirement for eco-labelling can also assist companies in improving their environmental performance.

There are several schemes to provide environmental information on products. The International Standards ISO 14020-14025 (Environmental labels and declarations) standardises labels based on the level of transparency of the environmental assessment.

An international scheme called the Global Eco-labelling Network (GEN) comprises not-for-profit national bodies which independently certify products for their environmental values based on a product life cycle assessment. Companies such as Good Environmental Choice Label Australia, affiliated with GEN, independently certify the products of a company to the standards of ISO 14024.

Other 'labels' such as Greenhouse Friendly that relate to the carbon emissions of a product have been listed in the *Energy efficiency programs (E3)* fact sheet.

For more information visit: Global Ecolabelling Network, www.gen.gr.jp
Good Environmental Choice Label Australia, www.aela.org.au
Greenhouse Friendly www.climatechange.gov.au/greenhousefriendly/index.html

Food integrity

Food integrity is the concept of understanding the whole supply chain of a food product and ensuring food safety, quality and security along the chain, including for example, the ethical protection of workers and animals, environmental protection and security of food product from accidental and deliberate contamination.

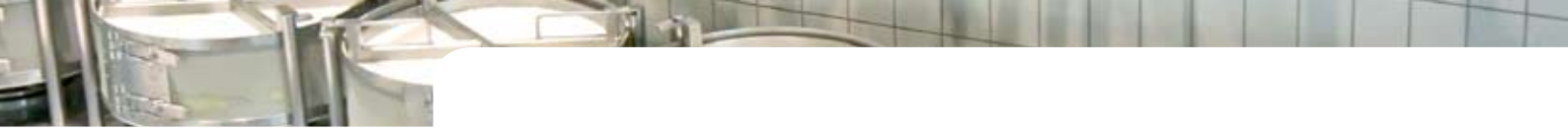
Traceability along the whole chain is central to food integrity as it allows an assessment of food based on aspects that may not impact the quality or taste of the food but could impact on ethical issues and food safety. For example, the use of eggs from a free-range hen as opposed to a barn-raised hen may not impact on the flavour or nutritional value of the egg but does impact on animal welfare. Traceability also provides a means to assess and rectify any breaches of quality as quickly as possible.

As consumers increase demand on manufacturers to guarantee the food safety, security and quality of products, the concept of food integrity and product traceability will increase.

For more information visit South Australian Food Centre, Food Integrity
www.safoodcentre.com/industry/pages/regional

Supply chain management

Integration of supply chain management is likely to become more important as companies try to reduce their environmental footprint. For example, food processors can work with suppliers to return packaging for reuse and use collapsible display-ready packaging. Similarly, food processors can work with customers to streamline packaging and delivery schedules to reduce product loss. Influence from customers may also reach down the supply chain onto food processors, for example, supermarkets may request eco-labelling on products to assist customer information. It is likely that the integration along the supply chain will become more common in the coming years.



REDUCED PRODUCT LOSS THROUGH SUPPLY CHAIN RELATIONSHIPS

Harvest Freshcuts in Wacol produce freshcut salads. Product loss and customer complaints have been reduced by working with individual suppliers to ensure produce is stored correctly between leaving the factory and consumption. This personal relationship with individual sellers ensures the quality of the food is maintained for the customer. (Harvest Freshcuts is an eco Biz participant.)

Outsourcing

Using contractors to look after specialist equipment such as cooling towers or refrigerators has been happening for years. There is also a trend towards outsourcing other services such as cleaning and chemical use. The benefit of outsourcing is that companies can focus on their core business of producing food and bring about reduced costs through access to third party expertise and competition for specialist activities.

The downside of this approach can be the lack of cohesion between the objectives of the food processing company and specialist contractors. Conflicts can occur between the food processor's environmental objectives and the specialist company's aim to reduce its costs through efficiencies that may not be environmentally sensitive. When looking to outsource activities, consider including environmental objectives in contracts such as continuous improvement percentage reduction in water or chemical use.

Automation/process control

There is a trend towards automation and process control, using highly specialised robots to replace humans in mundane tasks within the food processing plant, such as to pick up butter or cut meat. Automation of tasks can help to reduce waste through consistent and accurate repetition. For example, meat cut by automation can consistently cut at the same location on the carcass providing consistent products and minimising waste through inaccurate cuts caused by human error. Automation can also result in tasks being completed in a shorter period helping to increase production.

This series of fact sheets provides examples and suggestions to the modern food processor on how to achieve both economic and environmental benefits from eco-efficiency. Visit the project website www.ecoefficiency.com.au for more ideas and case studies.

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This series of eco-efficiency fact sheets will demonstrate the importance of water in a modern food factory and suggest areas where savings can be made. The project website www.eco-efficiency.com.au has more ideas and case studies on water savings across the food industry.

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