Module 4: Managing Quality and Logistics

Learning outcomes

On successful completion of this module you will be able to:

- Understand the role of logistics in supply chain management
- Understand the importance of Quality Standards throughout the supply chain
- Understand the role of traceability throughout the supply chain
- Describe the advantages and disadvantages of key traceability tools

Learning resources

Readings

Busicchia, B. 2013, *Horse meat scandal's long take highlights risks of lengthy supply chains*, The Conversation, 26th February. Click this link to access the article.

4.1 Introduction

While Module 3 overviewed supply chain management, this module focusses on three specific issues that are important from a supply chain perspective, the physical distribution issues (or logistics) involved in getting product from producers to consumers, the importance of quality standards throughout the supply chain and the role of traceability in the supply chain. Each of these issues is addressed in turn.

4.2 Logistics

Logistics (in terms of food) is the management of the flow of products from the producer, through the various supply chain members to the ultimate customer or consumer. The ultimate goal of logistics is to have complete integration of ordering, manufacturing, sales and distribution. Traditionally the first step is forecasting sales/demand which influences production – however in fresh produce this is complicated due to issues around seasonality and unsure production volumes (due to natural occurrences like floods etc.).

The key functions undertaken to get product from producer to consumer are:

- **Order processing** – the creation, transmission and receipt of order information (this is particularly critical when dealing with perishable food products which may need to be ordered on a daily basis – and in some cases in restaurants/food service more than once a day).
- **Warehousing** – the design and operation of facilities for storing and moving goods. Again, in the case of perishable food products this requires specialised facilities, often refrigerated cool stores, where issues like the maintenance of temperatures within specific ranges is critical to maintain product quality.
- **Inventory management** – maintaining adequate quantities and assortments of products to meet customer needs. Again, the seasonality and perishability of many food products adds an extra challenge to this function.
- **Transportation** – the movement of goods throughout the supply chain. Several decisions are faced regarding transportation – often balancing cost and speed. Again given that food is often produced in remote or rural locations, quick transportation is critical to get food through the chain in optimal condition.
- **Materials handling** – the physical handling of products. Again, many food products require careful handling (e.g. fresh soft fruits, live lobster) to maintain quality.

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How much effort goes into creating a bottle of water? The following video dissects the supply chain processes required to produce bottled water and highlights the chain complexity of such a simple product.

Video

4.3 Quality Standards

As discussed in Module 3, many fresh food products are in danger of being treated as commodities, bought and sold purely on price, often resulting in a downward price spiral. One way to prevent the commoditisation of a product is through quality assurance. If consumers are confident that product quality is reliable every time they purchase a product, they are prepared to pay a premium. Quality Standards are one way to ensure consumers get a consistent quality every time they purchase.

Quality Standards need to start with the consumer (as should all Supply Chain decisions). What is it the consumer wants and values? These standards then need to be monitored and maintained at every stage of the supply chain. The link below to Meat Standards Australia is a great example of following this approach to developing, implementing and maintaining quality throughout the supply chain. Note as you read this article how the whole approach closely reflects the principles of SCM outlined in the previous module, that is, a focus on consumers, good information flow, and continual monitoring with consumers and all supply chain members. The results of implementing this approach are also clear with a reversal of the decline in meat consumption.

Activity

Meat Standards Australia –

From this link – click on the 'Download the MSA Beef Tips and Tools Kit'.

Pages 3 and 4 give a good summary of the key features of the MSA beef quality system. In particular note:

- The system originated based on extensive ***consumer research*** exploring a decline in beef consumption
- MSA involves ***all sectors*** of the beef production chain from paddock to plate
- Feedback (***i.e. information***) on eating quality is fed back to processor, feedlot and producer i.e. consumer research is continuous
- It is a voluntary cooperative program, but when you do participate and are licensed you are subject to checks and audits

The success of the program is reflected in consumers buying more beef (even at higher prices) when assured that quality is reliable.

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MSA01

What is MSA?

Meat Standards Australia (MSA) is a valuable asset to the Australian beef industry, providing opportunities to differentiate product in the market. Unlike existing industry description systems, MSA accurately predicts eating quality for individual beef muscles.

The complex series of factors which result in the eating quality of a beef meal are taken into account in the MSA production and grading process. This solves the long-standing consumer problems of selecting beef and choosing an appropriate cooking method.

Beef purchasing by consumers

The MSA labels provide a consumer assurance of eating quality at three levels, MSA 3, 4 and 5 in conjunction with cooking method.

This is all the consumer needs to know to purchase and prepare beef with confidence.

Application of the system can provide a dynamic new consumer focus and drive positive change in beef industry trading systems. At retail, description by final eating quality result can be linked to price and replace the complex and often misleading system of cut names and quality descriptions now used. Relating MSA grade results to price along the production chain can encourage and reward production systems that aid in improving consumer acceptance of beef.

Replacing variable quality with accurate eating quality grades can underpin branded beef programs and provide a basis for improved demand with an associated shift in price and volume.

Key points

- MSA removes the need for consumers to have specialist beef knowledge.
- MSA retail labels advise the correct cooking method for every piece of beef to assure the eating quality result.
- MSA product must meet consumer set standards at one of three quality levels: MSA 3, MSA 4 or MSA 5.
- MSA involves all sectors of the beef production chain, from paddock to plate.
- MSA provides detailed feedback on eating quality to the processor, feedlot and the producer.

How did MSA begin?

MSA began as an industry program in 1996 following detailed consumer research investigating the continuing decline in beef consumption.

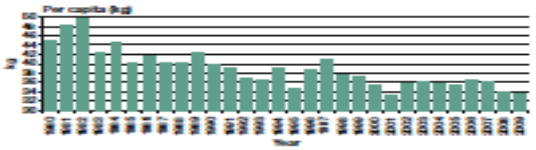

Figure 1: Beef consumption per capita 1980 – 2009

GRADED

The key problems identified in MSA research were a reduced level of cut and cooking knowledge among consumers and the degree of quality variation in the beef available. The period of beef consumption decline coincided with growth in competitive products offering greater consistency and less demanding product knowledge. While relative pricing had also changed, consumers stated they would buy more beef, even at higher prices, if it was reliable.

The consumer standard

A total consumer focus has been the foundation of MSA development. The grade target has always been to accurately establish and satisfy consumer set standards. Early MSA research investigated consumer taste parameters to establish the degree of variation between consumers. Grading could not be effective without a reasonable consensus view of eating quality. The findings established that there was very strong agreement on beef eating quality among consumer groups. From this, base protocols were established to utilise consumers in testing the full range of beef produced. The scoring system and boundaries to define grades have been strictly set from analysis of the consumer results unrelated to all production factors.

All MSA beef is graded on the basis of the consumer test score predicted for a particular beef muscle cooked by the nominated method. Further information on consumer testing and grade standards is available in *MSA Tips & Tools: How MSA grades are determined.*

How is the MSA grade established?

The MSA grade is established by calculating the direct and interactive effects of all factors established as affecting eating quality. Over 86,000 consumers, across eight countries have participated in MSA consumer testing providing scores on over 603,000 beef samples from more than 63,000 individual cuts. A very large database contains details of the consumer scores for each cut in conjunction with product information. This includes the animal's breed, sex, age and growth history, detailed processing and chiller assessment data together with the individual cut and muscle, days of ageing and cooking method tested.

Analysis of this data has established a series of factors which, when used in combination, allow the consumer score to be predicted with reasonable accuracy. No single factor is all-important, which is why grades based entirely on breed, dentition, marbling or other single attributes fail to assure eating quality. Virtually all steps in the production process have some impact on the eventual consumer result.

The MSA-trained graders collate information provided from the cattle supplier, through the MSA vendor declaration, with abattoir information and chiller assessment detail. The data is entered into a hand held computer that enables a complex statistical calculation to be made estimating the interactive effect of all factors on eating quality. Information on each carcase is provided to the abattoir and the supplier in MSA feedback.

The program then produces a grade score specific to each muscle for each applicable cooking method, covering ageing periods from 5–35 days. This determines the consumer label to be used. Individual carcases are stamped with an eating quality group. Eating quality groups collate carcases that share cuts within grade score ranges to enable accurate carton labelling. Further details on the grade calculation process, the grading procedure and each grading input may be obtained in other MSA tips and tools.

How is MSA integrity maintained?

MSA is a voluntary cooperative program requiring coordination and rewarding best practice across all industry sectors. Those who choose to participate in MSA are licensed, with license conditions requiring detailed audits and total product integrity. Producers and feedlots are registered and provide required information via a MSA vendor declaration. Abattoirs, wholesalers, retailers and food service outlets are licensed and incorporate MSA requirements into their quality assurance programs. The MSA accredited graders perform the grading function on behalf of the industry. Grader accuracy is monitored through frequent analysis and graders are required to complete regular correlations against the grading standards. Consumer complaints are monitored and product is traced back to the source.

For more information

Visit www.mla.com.au/msa or contact MSA 1800 111 672.

Level 1, 165 Walker Street,
North Sydney NSW 2060
Ph: +61 2 9463 9333
Fax: +61 2 9463 9393
www.mla.com.au

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Activity

You may like to spend 10 or 15 minutes browsing the MLA website as it give insight into several topics addressed throughout this course. In particular note the section on traceability and safety – this section outlines several initiatives throughout the supply chain focussing on this issue – specifically note that a key reason for the traceability and safety measure is market access to export markets – without the initiatives in place Australian meat could not be exported.

The vignette below gives a brief overview of the approach used to develop a quality charter for the Australian farmed barramundi industry. Note in particular the inclusion of representatives from all sectors of the supply chain.

Barramundi Quality Taskforce

CHARTER (September 2012)

Background:	For over a decade, the barramundi industry has recognised that in the face of price pressures from low cost imports, and in order to effectively undertake generic promotion of Australian quality barramundi, there must be consistent or minimum quality standards across the industry to justify the price premiums required.
Vision:	That Australian produced barramundi is Australia's premier eating fish.
Purpose:	To develop and implement production and management practises right through the supply chain to ensure that Australian produced barramundi delights our consumers every time.
Membership:	The role of members of the taskforce is to provide sectoral expertise to help develop the industry's management practises. It is not to represent the organisations from which they come. Members are comprised of: Production expertise – (*3 industry representatives – farmers)* Supply chain expertise – (*a seafood agent, quality expert and fishmonger*) Retail expertise – (*from major supermarket chain*) Researchers – (*3 CRC researchers: science, value chain, and consumer)* Resources – (*ABFA Executive Officer, 2 CRC managers*) Facilitator – (*industry practitioner, expert in food marketing)*
Process:	Recognising that quality is a whole of supply chain issue, the taskforce will develop a draft-integrated quality management system for barramundi, from production to retail, that is effective, practical and affordable. The draft will include proposed standards, management practises, training, auditing, market pull-through strategies and cost recovery. The draft will then be tested with industry, seeking input and acceptance from producers and key supply chain partners, prior to final approval by ABFA and then implementation.

4.4 Traceability

Traceability is important for two reasons: food safety and consumer marketing. While the extract from the food standards website highlights the issue of food safety, it does not address the area of consumer marketing. In brief – consumers are increasingly interested in knowing where their food comes from – its provenance. CRC research found that in the case of seafood, 46% of consumers had a strong interest in knowing where their seafood came from (Lawley and Birch 2010), more specifically; 39% wanted to be able to purchase authentic Australian products. Traceability ensures this is possible.

Traceability is the ability to track any food through all stages of production, processing and distribution (including importation and at retail). Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain.

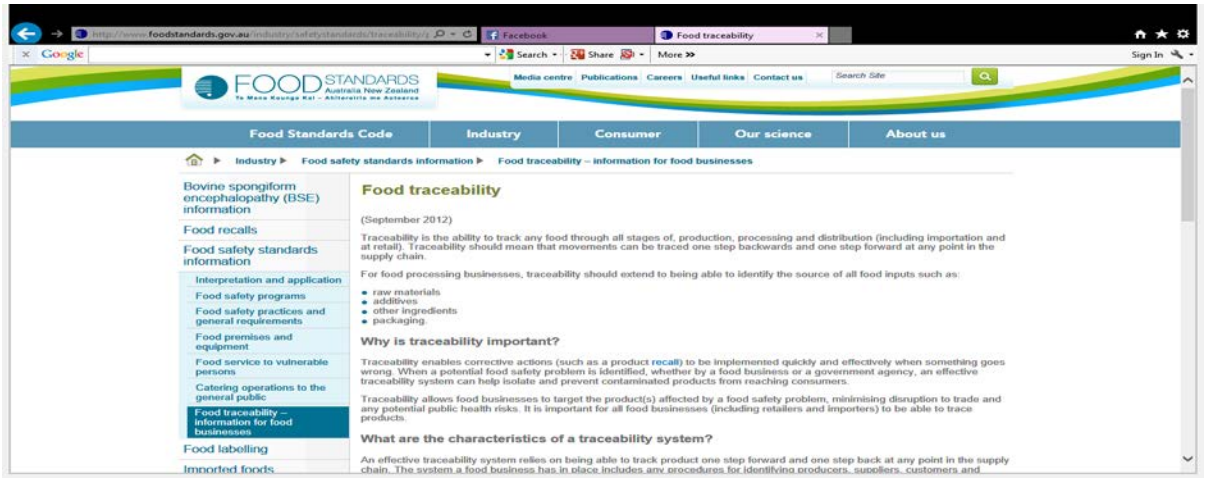
For food processing businesses, traceability should extend to being able to identify the source of all food inputs such as:

- Raw materials
- Additives
- Other ingredients
- Packaging

Why is traceability important?

Traceability enables corrective actions (such as a product recall) to be implemented quickly and effectively when something goes wrong. When a potential food safety problem is identified, whether by a food business or a government agency, an effective traceability system can help isolate and prevent contaminated products from reaching consumers.

Traceability allows food businesses to target the product(s) affected by a food safety problem, minimising disruption to trade and any potential public health risks. It is important for all food businesses (including retailers and importers) to be able to trace products.



Website

Food Standards Australia and New Zealand –

This site outlines the basics of food traceability including the Food Standards Code that should be adhered to.

Reading

Busicchia, B. 2013, *Horse meat scandal's long tail highlights risks of lengthy supply chains*, The Conversation, 26th February – Accessible here.

This reading outlines the supply chain issues that contributed to the European horse meat scandal that started in September 2012. The author notes that "The complexity of the food supply chain is outstanding. Between the French supermarket shelf and the Romanian meat producer, there have been four other intermediaries: the food brand, the food manufacturer, the meat processor and the trader". The reading also highlights issues of oversupply (of horsemeat), the opportunistic behaviour of some intermediaries, self-regulation and food safety.

While some products provide a barcode or tag which allows consumers to get the history of their product – whether it is eggs or seafood - increasingly sophisticated technology is being used to improve traceability throughout the supply chain – especially in the case of high value products. An example is RFID (radio frequency identification) technology which will allow any item to be tracked through the supply chain at any point in time. RFID provides a permanent security tag.

Activity

Think about your purchasing of food – are there certain products where you are concerned about where they come form – and other products where you are not concerned? When you are concerned about provenance – why? Does the provenance act as a quality indicator?

4.5 Conclusions

Successful food marketing is based on meeting consumers' needs consistently. This module has highlighted several issues critical to maintaining product quality throughout the supply chain and the decisions and implementation issues that arise in each area.

Traceability Case Study – Northern Prawn Fishery

Traceability in the seafood industry, particularly the wild catch sector, can be challenging as vessels can be at sea for extended periods, weather and communications can be uncertain and conditions are constantly wet! The PowerPoint slides for this module present a case study of the implementation of a traceability system in Australia's Northern Prawn Fishery.

The case outlines the process followed as well as the trial of three different systems to arrive at a workable approach for this context. The case study also presents the findings of the cost/benefit analysis undertaken on the supply side to quantify the benefits implementation of a traceability program can produce.

Australian Salmon

A project was undertaken for the Australian SCRC (Seafood Cooperative Research Centre) to gauge consumer perceptions regarding Australian salmon and to study the fishing/handling procedures undertaken to get the salmon from the ocean to the plate. The project exists to determine whether the Australian salmon industry can be sustainably commercialised in Western Australia.

The final report found that the stagnation of salmon harvesting techniques over the past few decades has detrimentally influenced salmon quality, seeing consumer confidence in the local product fall. The report recommends that these harvesting practises and post-catch handling procedures can be significantly improved, as these elements directly determine product quality.

For example, post-harvest quality studies showed that the use of Iki jimi (a slaughtering method causing immediate death) minimises stress and increases the shelf life of salmon by up to a week, compared to salmon not slaughtered using this method. The report recommends that Australian salmon be harvested according to this method to increase salmon quality.

Another major recommendation of the project was to introduce a Quality Index scheme into the industry to predict the salmon's shelf life (based on appearance, odour and texture of the fish). The project introduced the Scheme into the Western Australian salmon industry, providing a consistent and rapid measure of salmon quality.

The project's consumer preference studies also found that Australians confuse Australian salmon with Atlantic salmon. Even though Atlantic salmon may be farmed in Australia, the two species have vastly different flavour, texture and cooking characteristics. In addition, sensory evaluations of the salmon (when optimally processed and prepared) showed the fish to be consistently preferred over other species such as mullet and whiting. Therefore, a market could be potentially developed for Australian salmon.

The report also assessed the optimal packaging required to facilitate the commercialisation of Australian salmon, as well as potential product development opportunities. It was found that vacuum packed frozen fillets provided optimal retention of product attributes, allowing shelf life to be maximised for a more consistent and desirable product to be distributed. Ready-cooked meals and a smoked product variant were also considered as future product development alternatives.

References

Birch, D. & Lawley, M. 2010, *Repositioning Australian farmed barramundi: Online consumer survey findings*, Sunshine Coast: University of the Sunshine Coast.

Salmon Retail Transformation Vignette References

Dods, K., Williams, H., Howieson, J. & Stevens, R. 2011, *Retail transformation: Identifying opportunities for creating consumer focussed Australian salmon value-added products*, Australian Seafood Cooperative Research Centre.