

CHAPTER 12

CROP MARKETING

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INTRODUCTION

Crop marketing has traditionally been the process of managing the price risk that is so typical of agricultural commodities. Agricultural commodities are undifferentiated agricultural products, which are the main outputs from agriculture. The output of one producer or producer group is not readily distinguished from that of another producer or producer group. Quality differences may be represented by different grades, but within a given grade there is no distinction made between the output of different producers. Agricultural commodities are typically traded on open markets where relatively small shifts in supply or demand can lead to large swings in prices. Because any individual farmer is a price-taker in such markets, the farmer's marketing strategy must basically be one of how to control price risk.

However, in recent years a new approach to crop marketing has emerged whereby some farmers are producing crops that are, in some way, differentiated from those of their neighbours. Consider the case of Warburton, the largest independent bakery in the UK producing over 3 million loaves of bread per week. During the late 1980s they noticed a decline in bread quality which threatened their position as a premium baker. Their research indicated that some Canadian wheat varieties worked best in their bread-making system. To ensure they would only obtain the desired varieties of wheat, they entered into production contracts with some Canadian farmers and a grain handling company to ensure identity-preserved shipments. According to Holmlund and Fulton (1999)

“The farmer agrees to produce a particular variety. Crops have to be grown from certified seed, purchased from an approved seller. The producer must employ good farming practices to grow the crop, and properly store and protect the harvest. The producer also submits a report on weather conditions, use of inputs and crop yield, along with a sample of the wheat...In return for meeting these standards, Warburton contract farmers receive a \$20/tonne premium over the regular CWB (Canadian Wheat Board) price for identical grain.”

The Warburton example is one example of a broad phenomenon occurring in the agrifood sectors in many countries. People used to refer to agriculture as a supply-driven industry – that is, one in which farmers focused on producing the crops they were good at producing and hoped the market would find a home for their produce. Now, agriculture is increasingly referred to as a demand-driven industry – that is, one in which farmers focus on producing what the customer demands. This of course is a generalisation – not all farmers were supply-driven before and not all farmers are demand-driven today. But the trend is significant enough that people talk about the revolution in terms of the *industrialisation of agriculture* and the *new agriculture*. This revolution is all about managing the supply chain, as in the Warburton example. Farmers begin to see themselves as part of the food industry rather than the agricultural industry. The supply chain represents the production-marketing chain through which an agricultural product travels from agricultural producer to the end consumer – or ‘from gate to plate’ as some people put it. Grain may leave the farm as a raw agricultural commodity and end up as a processed food in a retail store anywhere in the world. Good management of the supply chain involves squeezing costs out of the supply chain and

developing the production/marketing relationships needed to respond quickly and efficiently to shifts in customer demands.

Thus, there are two quite different dimensions to crop marketing depending on whether or not the farmer is involved in producing a *commodity* or a *differentiated product*. These are further explored.

CROP COMMODITY MARKETING

Crop commodities are undifferentiated crop products where one tonne of a particular grain (e.g. durum wheat) produced by one farmer is indistinguishable from that produced by other farmers within a given grade. In respect of the *economics of commodity markets*, it is apparent that the nature of commodity supply and demand leads to considerable price uncertainty, hence, the need for a discussion of *commodity price risk and the futures markets*. Futures markets are a useful tool for managing price risk.

Economics of commodity markets

The economics of commodity markets is a way of explaining how prices are established between suppliers of commodities (farmers) and the buyers of these commodities (e.g. food processors). Basically it involves the interaction of supply and demand.

The demand for food products at retail is the *primary demand* in the food system. This primary demand translates into *derived demand* at various stages in the food system. For example, primary demand by consumers for pasta governs the derived demand for durum wheat at the farm level. Primary demand and then derived demand at the farm level are now considered.

Primary Demand

The law of demand states that, other things being equal, quantity demanded falls as price increases. The demand curve graphs the schedule of quantities sold at various prices (Figure 12.1).

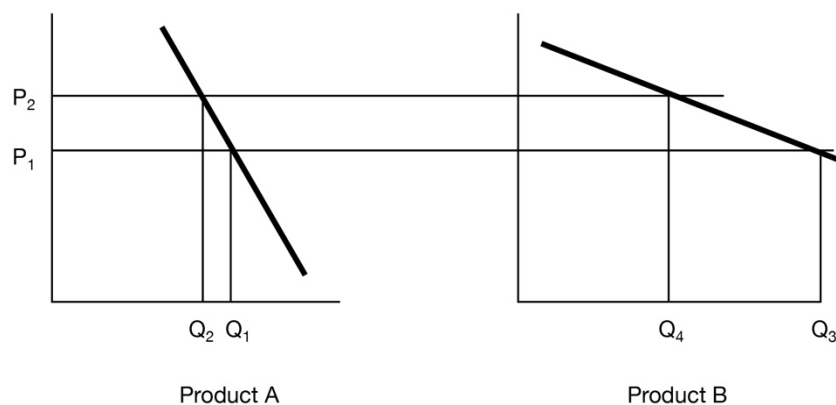


Figure 12.1 Demand curves for two food products with differing elasticities of demand

Figure 12.1 shows two demand curves of different slopes. A price increase from P_1 to P_2 causes the quantity sold of product A to fall from Q_1 to Q_2 and causes the quantity sold of product B to fall from Q_3 to Q_4 . Note that the demand for product A is less responsive to a price change than is the demand for product B, that is, the demand for product A is less elastic. The *price*

elasticity of demand is defined as the percentage change in quantity demanded for a given percentage change in price. Thus, for example, if the price of bread increases by 10% and, as a result, the quantity of bread demanded decreases by 2%, the price elasticity of demand for bread is -0.2 .

Which then would have a lower price elasticity of demand – bread or beef?

The answer is bread. Bread is considered to be a necessity in most homes and it is unlikely that a 10% rise in the price of bread would have much effect on the demand for bread (or the underlying commodity - wheat). However, a 10% rise in the price of beef is likely to cause a larger reduction in the quantity of beef demanded as consumers would look to substitute beef with chicken, lamb and pork, which are now relatively cheaper. This example illustrates that the main factor influencing the price elasticity of demand is the existence of *substitutes*. For products like bread with few substitutes, the demand is relatively inelastic while for products like beef with close substitutes, the demand is relatively elastic.

Consumer *income* is another important factor affecting the demand for food products. Over 100 years ago, a German statistician, Engel, showed that as individual incomes increased so their consumption of food products first increased at an increasing rate. However, beyond some point, the demand for food products would start to slacken as the individuals became satisfied. Further increases in income would lead to increases in consumption but now at a decreasing rate. Beyond some income levels, the demand for some foods might actually start to decrease. This tends to be the case for some starchy foods like cassava and potatoes.

Over time, the *tastes and preferences* of consumers evolve and can have a substantial effect on the demand for food products. Examples include the growing demand for microwavable foods, and for foods that are natural ('organic'). In the UK, when the bovine spongiform encephalopathy (BSE or mad cow disease) crisis was in full swing, there was a massive reduction in the demand for British beef.

What other ways have consumer tastes and preferences for certain food products obviously changed in recent years?

Derived demand

Derived demand is the demand at various stages of the supply chain other than the retail level (which is the primary demand). Two levels of demand in a simplified pasta food system are shown in Figure 12.2 below: pasta at the retail level and durum wheat at the farm level.

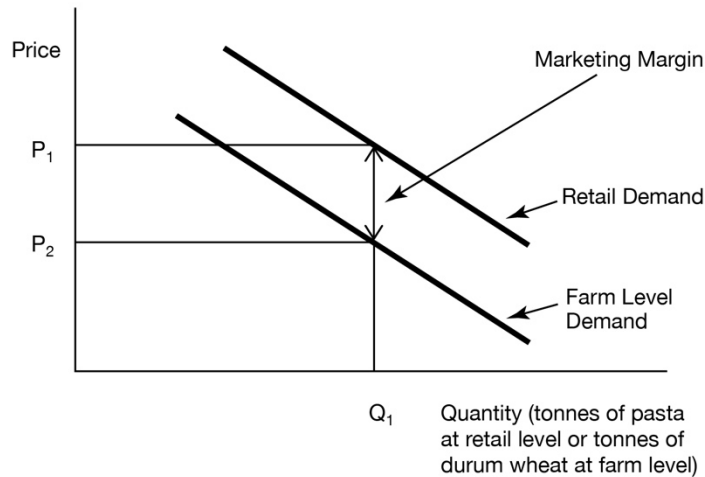


Figure 12.2 Primary demand, derived demand and the marketing margin

Quantity along the horizontal axis represents tonnes of durum with respect to the farm level demand curve and tonnes of pasta with respect to the retail level demand. By putting both pasta and durum on the same axis, we are implicitly assuming a constant conversion rate. Suppose the conversion rate is that 2 tonnes of durum wheat produces 1 tonne of pasta, then Q_1 might represent 1000 tonnes of durum and 500 tonnes of pasta. Along the vertical axis, P_1 represents the retail price of pasta (say \$4000/tonne) and P_2 represents the corresponding price per 2 tonnes of durum (say \$500/t).

The *marketing margin* is the vertical difference between the primary and derived demand curves, in this case \$3500. It represents the cost of other ingredients, plus the cost of services involved (processing, wholesaling, storing, retailing and transportation).

It can be seen from the figure that the farm-level demand for the commodity will be very much influenced by retail-level demand and by changes in the marketing margin.

Supply of agricultural commodities

The supply of an agricultural commodity is determined by:

- price of commodity;
- the prices of alternatives in production that compete for the same resources;
- the prices of inputs used in the production of the commodity;
- the changes in technology in the production of the commodity.

An increase in the commodity's price usually leads to an increase in the quantity supplied to the market. In Figure 12.3, this is shown by the two supply curves which are upward-sloping to the right.

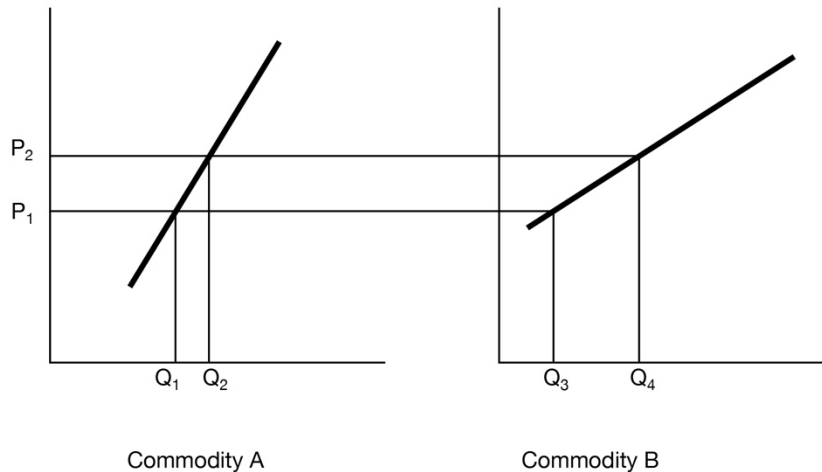


Figure 12.3 Supply curves for two commodities with differing elasticities of supply

Elasticity of supply is defined as the percentage change in quantity supplied for a one percentage increase in the price. In Figure 12.3, commodity B is more price elastic than commodity A. The elasticity of supply for an agricultural commodity is influenced by:

- *availability of alternative enterprises*. The more alternatives available to the farmer, the more flexible he/she will be in switching production enterprises and hence the greater will be the elasticity of supply;
- *time*. Supply is generally more elastic in the long term than in the short term, because farmers can make changes more easily if they have more time;
- *perishability/storability*. The supply of perishable commodities tends to be price inelastic because suppliers have no choice but to move their product to market;
- *excess capacity*. Supply is more elastic when there is excess capacity. Think of a half-empty feedlot vs a full feedlot. It is easier to expand in response to a price increase if the feedlot is half-empty;
- *industry structure and organisation*. If the industry is atomistic (i.e. many producers), there is more pressure on producers to respond to price increases and price decreases than if the industry is monopolistic.

There are a number of factors which can shift the supply curve to the right or left. These factors are called the '*determinants of supply*' and include:

- *changes in the prices of alternative products*. An increase in the price of a competing substitute in production tends to shift the supply curve to the left. For example, a crop producer may lower the area sown to wheat if the canola price increased relative to the price of wheat.
- *changes in input prices*. Other things being equal, an increase in the price of an input will result in decreased output. For example, if the price of fertiliser increased substantially, there may be a reduction in its use and hence some reduction in crop production.
- *changes in technology*. A technological advance occurs where more output is produced from the same input mix. For example, the 'green revolution' of the 1950s and 1960s resulted in significant increases in yields per acre for staple crops such as wheat and rice. This had the effect of shifting the supply curve for those commodities in those countries to the right.

Effects of supply and demand changes on price

A commodity's price is established at the intersection of the (farm-level) derived demand curve and the commodity's supply curve. Prices change because the supply and/or demand curves shift as shown in Figure 12.4 below. Figure 12.4-A shows the effect of a shift out in the supply curve (from S_1 to S_2). This may be caused by any of the determinants of supply. For example a technological advance would shift the supply curve out to the right so that producers would be willing to supply any given quantity at a lower price than before or would be willing to supply more at the same price. The end result of this technological shift is a new equilibrium commodity price which is lower than before ($P_1 \rightarrow P_2$) and a new equilibrium quantity marketed which is higher than before ($Q_1 \rightarrow Q_2$).

Figure 12.4-B shows the effect of a shift to the right in the demand curve, say through a rise in incomes (due to prosperity). The end result of this income rise is a new equilibrium price which is higher than before ($P_3 \rightarrow P_4$) and a new equilibrium quantity marketed which is also higher than before ($Q_3 \rightarrow Q_4$).

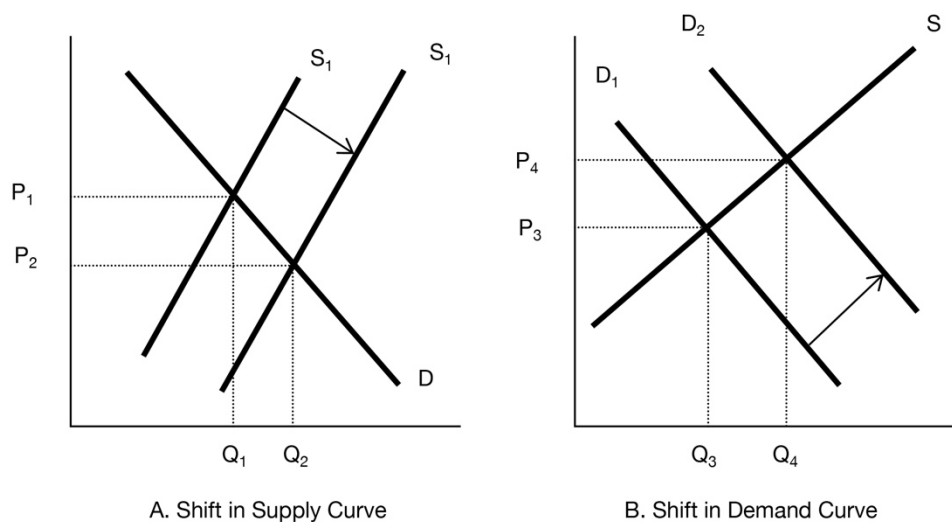


Figure 12.4 Shifts in supply and demand curves and the effects on price

The more inelastic is the demand curve, the greater will be the impact of a given supply shift on price and the more inelastic the supply curve, the greater will be the impact of a given demand shift on price. In the case of agricultural commodities, both demand and supply tend to be inelastic and so relatively small shifts in supply and demand can cause large movements in price.

Commodity price risk and futures markets

Producers of agricultural commodities are typically subject to considerable price risk. Since commodities are undifferentiated products, the supplier is a 'price taker' and sells at the going market price. But, as discussed above, commodity markets are characterised by highly inelastic demand and supply curves. This means small shifts in supply or demand lead to large changes in price. Agricultural producers are particularly prone to price risk because production decisions are made today and the results of those decisions happen in the future. Hence, a major concern of crop producers is to find ways to manage price risk. One way of doing this is to *hedge* the commodity using futures contracts.

Here, the role of futures markets in managing price risk is discussed. First considered are *futures markets and contracts* and the notion of trading price risk for the purposes of hedging. Next is a discussion of the *relationship between cash and futures prices*. An understanding of this is essential to understanding how hedging works. Finally, *hedging as a trading strategy* is examined.

Futures markets and contracts

Futures contracts originate as *forward (or to arrive)* contracts. A forward contract is a deferred delivery contract in which the seller is required to deliver a specific quantity of commodity at a future date and for a predetermined price. It can be seen as a form of market insurance. The farmer is assured of having a buyer at a specified price, while the buyer is assured of commodity being available under agreed terms. The motivation to enter into a forward contract is the desire to trade in the *physical commodity*.

There was some popularity in forward contracts prior to the introduction of futures. One problem with forward contracts was the heterogeneity of the contracts. They were not designed to be traded in a mass market and tended to be written in specific terms to suit a particular exchange. There was also lack of assurance that all parties would perform according to the contract. This led to futures markets and futures contracts. Futures contracts were similar to the forward contracts except they had set standards for quality, quantity, delivery point and delivery time so they could be traded on mass markets. In addition, the futures contracts were guaranteed and contract obligations could be met by making an offsetting transaction at a later date (known as a *roundturn*). Roundturning meant the seller of a futures contract did not have to make an actual delivery of the commodity to fulfil the contract. The seller could fulfil the conditions of the contract by buying back an equivalent futures contract prior to the delivery date to offset the obligation. Almost all contracts are offset this way rather than through actual delivery. The purpose of futures contracts then becomes one of trading *price risk* rather than trading the physical commodity.

Relationship between cash and futures prices

The *cash* or *spot* price for a commodity is the current price for the physical commodity. This price is determined in the cash markets for the commodity by the intersection of supply and demand forces. The futures price represents the expectation of the spot price at some specified future time, called the *delivery date*. The difference between the spot price and the futures price reflects the information that the market has concerning factors likely to affect price movements between the present time and the future date set in the contract.

This difference is called the *basis*. For storable commodities like wheat and barley, the basis reflects *carrying charges*, such as storage costs, interest on inventory, and the risk premium due to holding stocks. Because carrying charges are positive, the basis is usually positive. That is the futures price is usually higher than the spot price. However, the basis may be negative, in which case we say the market is *inverted*. This may happen, for example, when there is currently a tight supply-demand situation but a bumper crop is expected following the next harvest. This will result in 'old crop' spot prices being bid up and 'new crop' futures prices being depressed.

Apart from the cross over from one crop year to the next, spot prices and futures prices will generally be affected by the same factors. It is sometimes suggested that futures prices cause spot prices, in other words that futures markets have an undue influence on spot prices. It

may be more correct to say that spot prices and futures prices are simultaneously affected by the same underlying factors.

As the delivery date approaches, the basis normally narrows. That is, the spot price approaches the futures price. There are two main reasons for the narrowing of the basis; carrying charges (on storable commodities) fall as the carrying time shortens, and the extent of uncertainty about the future declines as the forecast period shortens. Thus forecasting can be more accurate.

On the delivery date the spot price for that day and the futures price converge. This is a critically important fact. If, for some reason they did not, then arbitrage would occur to bring them into line. Suppose, hypothetically on the delivery date, the futures price for wheat was \$US4/bushel¹ and the spot price (same quality and location) was only \$US3.50/bushel. Speculators would have an incentive to buy the physical commodity and simultaneously sell futures contracts, using the purchased physical commodity to offset the futures contract obligation. This would net a tidy \$US0.50/bushel profit. Such action would also have the effect of raising the spot price and lowering the futures price so they would, in fact, come into line.

Hedging as a trading strategy

Hedging is a futures trading strategy whereby buyers or sellers of the physical commodity seek to offset the risk of an adverse price movement (rise or fall, respectively) in the physical market by taking a contractual position in the futures market at a fixed price. Hedging means that prospective buyers of the physical commodity will be short in physicals but long in futures, whereas sellers will be long in physicals but short in futures. This is referred to as holding opposite positions in the market for physical product and its *derivative*, the futures contract.

The *short hedge* is designed to protect future sellers of the physical commodity (e.g. crop producers) against price falls. It may be executed by a crop producer before the crop is planted, during the production period or at harvest (if the commodity is to be stored for later sale). It involves the hedger going short in the futures market (selling futures contracts) with the idea of buying them back later at the same time as the physical commodity is sold.

The *long hedge* is designed to protect future buyers of the physical commodity against price rises. It is used by processors and exporters who have made forward sales on the cash market, but who do not have the commodity purchased to deliver on these forward sales. It involves the hedger going long in the futures market (buying futures contracts) with the idea of selling them at the same time as the physical commodity is purchased.

While our primary concern here is with hedgers and hedging, another important player in the Futures Market is the speculator. Speculators seek to profit by selling and buying according to their understanding and beliefs of market fluctuations, trends and irregularities in the prices of futures. They have no position in the physical market. Speculators are often viewed with suspicion by the general public. However, they fulfil a vital function of adding liquidity to the market and ensure (through arbitrage activities) that the spot and futures

¹ A bushel is a measure of volume such that 1 bu = 1/3 bag (of wheat) = 8 gallons = 0.0364 m³

prices converge at the delivery date. Without speculators, Futures Markets would not function well and may not function at all. Hedgers want to transfer price risk away from themselves. In the futures markets, the ones who accept this price risk are the speculators.

To understand the principles of hedging, consider a simplified, hypothetical example of a farmer from Junee, NSW who has recently harvested a crop of ASW wheat and has 100 tonnes on hand. It is now February and the current price of ASW wheat is \$220/t. The farmer plans to hold the wheat for sale in June but wants to lock in a price today and so protect against a price fall between now and June. The decision is made to execute a *short hedge*. The farmer calls a broker and sells two July futures contracts (each contract is for 50 tonnes) on the Sydney Futures Exchange (SFE). Today's price of a July futures contract for ASW wheat (delivered to the GrainCorp silo in Junee) is \$250/t. This means, if the grain were held until the delivery month (July), the farmer could lock in a price of \$250/t. The farmer knows that in June, the basis (between spot and futures prices) is normally about \$10/t. Hence, if the farmer sells the physical grain in June, the locked-in price will be about \$240/t (i.e. \$250 minus \$10). This is regardless of what happens to the spot price between now and June. This is achieved as now described.

Suppose the spot price falls from \$220/t today to \$200/t in June. Given the June basis (between spot and futures prices) does turn out to be \$10, the July futures price in June will be \$210/t. Now when the physical grain is sold in June for \$200/t, the farmer buys back the two futures contracts at \$210/t, thus making a profit of \$40/t on the futures transactions (sold at \$250 and bought back at \$210). Adding this profit to the \$200/t earned from the sale of the physical grain, we see that the farmer has indeed made a total of \$240/t.

Now, suppose today's spot price (\$220) does not fall, but instead rises in June, to \$245/t. How will the farmer fare in this situation? Assuming the June basis is again \$10/t, the July Futures price in June will be \$255. This time, the farmer makes a loss on the futures transactions. In February, the contracts were sold at \$250/t but in June, they are bought back at \$255/t for a \$5/t loss. Combining this \$5/t loss with the sale of the physical grain at \$245/t we see the farmer's net position is a return of \$240/t, the same as in the previous scenario.

Regardless of what happens to the spot price, hedging allows a lock in of price. Hedging not only protects against a price fall, it also protects against a price rise.

Hedging has the effect of limiting an individual's exposure to price risk. An agricultural producer who is planning to sell the physical commodity at some future date can transfer the risk of price changes by hedging the crop. However, the agricultural producer is more concerned about price falls than about price rises. In fact, the producer may prefer to be exposed to the risk of price rises but protected from exposure to price falls. Processors and exporters may have the opposite concern. If they need to acquire the physical commodity at some time in the future, they might be concerned about exposure to price rises but do not want to be protected from price falls. The use of *options* contracts provides this insurance by establishing, respectively, minimum selling prices and maximum buying prices.

Options are rights, but not obligations to buy or sell an underlying futures contract. Options are either *call* options (the right to buy) or *put* options (the right to sell) and can be undertaken from either a long or a short position. By way of illustration, consider the position of a wheat producer. Suppose the grower wishes to insure against a price fall, but not against a price rise. By buying a put option, the grower purchases the right to sell an underlying futures contract at a specific price (called the *strike price*). In the earlier example the current price of

a July futures contract is \$250. Over on the Wheat Put Options Market, a number of different put options may be offered with different strike prices (say, \$230, \$235, \$240). For each strike price there will be buyers and sellers who will determine the price for the particular put option (called a *premium*). Suppose our grower wishes to insure against the futures price falling below \$240. The grower buys the relevant put option (i.e. with the \$240 strike price) at the current premium, which is, for example, 10c/t. If, between now and next June, the futures price falls below \$240 our grower exercises the put option (i.e. the right to sell a futures contract at \$240). If however, the futures price does not fall below \$240, the grower does not exercise the option and it expires 'out of the money'. In this way the grower has used the put option as an insurance policy against a price fall and, for this, the cost was 10c/t.

DIFFERENTIATED PRODUCT MARKETING

There has been a revolution of sorts in the agrifood sector. People talk about *the new agriculture* in which farmers and other participants in the supply chain are becoming more highly coordinated with each other. Partnerships and strategic alliances using long-term contracts (written and, in some cases, unwritten) are replacing arms-length business dealings. This revolution is all about managing the supply chain, as in the Warburton example previously discussed. Farmers begin to see themselves as part of the food industry rather than the agricultural industry. The supply chain represents the production-marketing chain through which an agricultural product travels from agricultural producer to the end consumer – or 'from gate to plate' as some people describe it. Grain may leave the farm as a raw agricultural commodity and end up as a processed food in a retail store anywhere in the world. Good management of the supply chain involves squeezing costs out of the supply chain and developing the production/marketing relationships needed to respond quickly and efficiently to shifts in customer demands.

Following is a description of the *megatrends leading to the new agriculture*, then a discussion of the nature of the *production-marketing system* in this new agriculture, and a discussion of *developing a niche market*.

Megatrends leading to the "New Agriculture"

The organisation of the crop production-marketing system is changing from open-market operations to contracts and alliances. This process has been called the *industrialisation of agriculture* or *new agriculture*. Industrialisation does not imply that plants and animals are produced using industrial-type production systems. It refers to an organisational change rather than a technological change.

The main drivers (megatrends) for industrialisation of the crop production-marketing system are three-fold:

- Consumers are becoming more discriminating in their tastes and preferences. This has encouraged greater vertical² coordination to enable supply chains to respond quickly to these changing consumer tastes and preferences.
- On the supply side, rapid technological advances have encouraged the development of vertical partnerships. In particular, these include *genetic engineering*, which allows agricultural raw materials to be tailored to the needs of processors and retailers, and *information technology*, which allows better communication among the various players.

- New government laws concerning legal liability have required retailers, processors and agricultural producers to exercise 'due diligence' with respect to food safety and quality issues. This has encouraged the players to develop quality assurance programs and vertical partnerships to ensure the quality of the foods sold on the supermarket shelves.

It is important to focus more closely on the consumer, who has been central to the changes taking place. Some of the recent trends are as follows.

Convergence in food preferences between countries

Connor (1994) found that European consumption patterns for a range of processed foods correlate highly with North American consumption 5 to 10 years earlier. He suggests that as incomes, prices and demographic factors in Europe catch-up with developments in North America, so food consumption patterns will converge. Traill (1996) also provides some evidence for increasing convergence of food consumption patterns between countries of Western Europe. However, he argues there are likely to remain differences due to cultural diversity. Thus, he argues we may see the emergence of 'homogeneous segments of consumers which cross national boundaries'. These include an Anglo-American group consisting of Australia, Canada, the United States, the United Kingdom, New Zealand, Ireland and South Africa. Another is a Latin-European group consisting of France, Spain, Italy, Belgium, Portugal and Latin America.

Greater diversity of foods consumed

Food markets in Australia, for example, have expanded to include a large number of ethnic foods (Italian, Chinese, Mexican, Greek, Indian and Thai). These ethnic foods are adapted for Australian conditions to produce a more generally acceptable flavour and texture.

Change in the type of food eaten

As a country develops, a smaller percentage of income is spent on food. In a less developed country (LDC) about 80% of income is spent on food. However, in an affluent country, it falls to less than 20%. The number of calories eaten increases from about 1500 calories/person/day in an LDC to about 3500 calories/person/day in an affluent country. Protein in the diet increases from about 40 grams/person/day in an LDC to about 85 grams/person/day in an affluent country. There is a change in the type of food eaten, including a decrease in basic carbohydrates (bread in Europe, rice in Asia, cassava in Africa) and an increase in consumption of meat and dairy products. Japan is a good example of an economy that has undergone a transition from an LDC to affluent country since WWII. During the past 50 years in Japan, the consumption of basic cereals has decreased while the consumption of meat, eggs, and dairy products has increased. Other important factors that affect the type of food eaten are:

- *Age* - baby foods, children's cereals, teenager snacks, diet foods for young women and low-fat, salt-free foods for the elderly.
- *Gender differences* – women are decreasing caloric intake faster than men due to being more nutrition-conscious.

²Vertical coordination refers to relationships up the chain from seller to processor to consumer. Horizontal coordination refers to relationships developed at one level in the chain (e.g. between buyers).

- *Education* – higher education leads to more varied eating habits (more willingness to try ethnic foods and more knowledge of nutrition).
- *Higher standard of living* – basic simple foods replaced by more sophisticated complex foods (e.g. consumer-ready meals purchased in supermarkets).
 - *Changing household behaviour* – family eating habits are important. The food provided by parents has an important influence. But so too do the pressures of modern living (e.g. advertising and media influences, households of single people who eat more food away from home, consumer-ready foods in the home, increased labour participation of women, microwave ovens).

Recent consumer concerns – four areas of concern in recent years have been:

(i) *Health/nutrition*

- Consumers are increasingly aware of the relationship between food and nutrition.
- Fat, cholesterol, fibre and calcium are a part of consumer consciousness. People have begun to realise that animal fat could be related to heart disease. (At the same time, new technology has allowed the growth of the vegetable oil industry to replace the more traditional technology involving animal fats).
- The growth in self-medication related to nutraceuticals (foods that provide medical and health benefits) will drive parts of the food industry closer to the pharmaceutical industry. A good example is cold breakfast cereals which began 100 years ago as cheap, high energy breakfasts. They have since been fortified with vitamins and trace minerals and now contain high fibre with low salt/low sugar levels.

(ii) *Food safety*

Pressure for change has come from:

- (a) highly publicised food poisoning outbreaks (e.g. BSE or mad cow disease in the UK, the Garibaldi smallgoods case in Adelaide);
- (b) the need for countries to be internationally competitive in food safety or risk losing market share.
 - Toxins can exist anywhere along the supply chain (e.g. in original plant or animal, added during processing, or added during storage of product). This has led to the development of HACCP (Hazard Analysis Critical Control Points) food safety systems from farm through to consumer
 - HACCP food safety systems represent a revolutionary approach to food safety designed to prevent three types of food safety hazards: (a) microbiological (e.g. *E. coli* bacteria, listeria, salmonella); (b) chemical (e.g. natural toxicants like fungi and aflatoxins, industrial pollution, pesticides, veterinary medicines and food additives); and (c) physical (e.g. during processing the food products could be contaminated by nuts and bolts from machinery, pieces of wire, finger bandages, glass from broken bottles).

(iii) *Quality*

- Modern production and processing methods have given rise to concerns about the loss of nutrients (e.g. from canning and freezing) and the presence of residues left in the food from agricultural production (e.g. pesticides, growth hormones, fertiliser). This has given rise to new quality control systems in processing (e.g. ISO 9000), new

methods of packaging, which extend the shelf life of food products (e.g. cryovac), the use of date marking and the growth of the organic foods industry.

- Date marking started with short-life products but has now been extended to cover most food products. The processor must guarantee food's quality for its indicated shelf life. It is illegal to sell a product beyond its 'use by' date.
- Organic food is fertilised with natural organic matter (manure) and minerals rather than chemical fertilisers, is grown without the application of pesticides and is processed without the use of food additives. There are problems with organic foods – uncertain supplies and rapid deterioration which give rise to significant wastage.

(iv) *Social and environmental concerns*

- Social and environment issues loom as the largest public concern of the decade. This concern encompasses chemicals leaching from the soil into streams and rivers, waste management in feedlots, *animal welfare* and *biotechnology*.
- With respect to animal welfare, animal care and protection groups have become vocal in recent times and are influencing production methods (e.g. free range eggs, free range pigs). This is particularly the case in the UK and other countries of Western Europe.
- Biotechnology is another area of growing concern, particularly in Europe. There has been a major debate on whether consumer concerns will derail the development of biotechnology products. In the past, biotechnology in the food area has focussed on production enhancements (i.e. increasing yields) which were not considered to be important to many consumers. This was particularly the case in Western Europe, which is distrustful of US agribusiness and where a widespread sentiment was that too much was being produced anyway. However, there is a new wave of biotechnology products that have real benefits for consumers (e.g. nutraceuticals – foods that are genetically engineered to provide medical and health benefits). When this happens, we are likely to see greater consumer acceptance of biotechnology products.

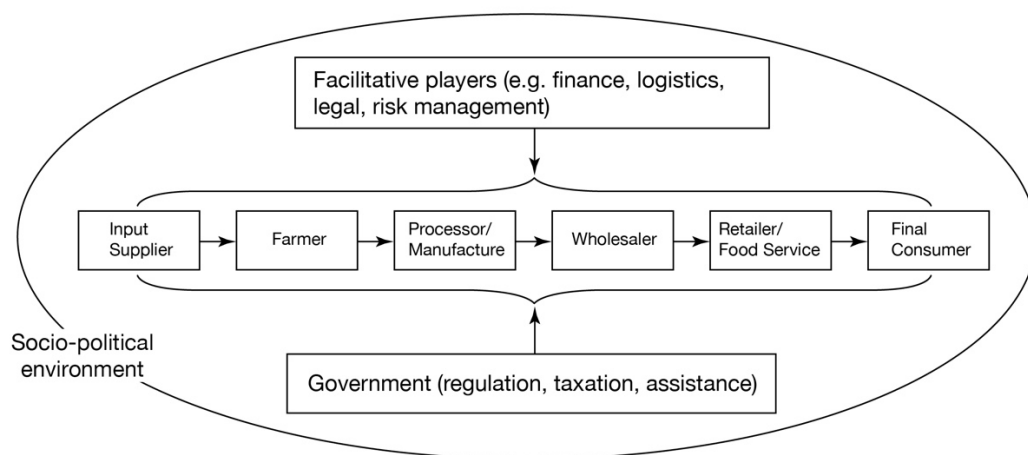


Figure 12.5. A simplified agrifood production-marketing system

All of these consumer concerns create challenges for the future. There is potential for more individual supply chains, with tight control over production, storage and distribution and *niche markets*. Some will work and others will not, but this is increasingly the story of the future of the agrifood industry.

The production-marketing system

A simplified version of a production-marketing system is summarised in Figure 12.5. The sequence of participants that delivers the final product to the final consumer is called the *supply chain* or *value (adding) chain* or *channel*. In Figure 12.5, these participants run from input supplier through to final consumer. In addition to these participants, the production-marketing system includes facilitative players and the government. Surrounding all this is the socio-political environment, which can significantly impact the production-marketing system. For example, this environment may lead to changes in government regulations and/or transactions costs.

The activities in the supply chain comprise:

- physical changes and movements (from left to right)
- flow of information (mostly from right to left)
- flow of money (from right to left) associated with change of ownership

There are two basic dimensions to the supply chain and its coordination: *vertical* and *horizontal*. The vertical dimension is concerned with the buyer/supplier linkages between the various nodes in the supply chain. The horizontal dimension is concerned with the structure of the industry at each node in the supply chain in terms of the number and size distribution of the companies. The various aspects of *vertical coordination* and *horizontal coordination* are now examined.

Vertical Coordination

Vertical coordination mechanisms range from *open markets* where companies operate at arms length from each other to carry out each stage in the production-marketing system through to *vertical integration*, where one company controls several stages. In between these two extremes are various kinds of *contractual relationships* (including managed linkages, contracts, partnerships and strategic alliances).

Open markets represent the traditional approach to vertical coordination in agricultural commodity markets. They have merit in their ability to discover prices that effectively and efficiently ration available supplies of standard commodities. However, they may not be very efficient in minimising transactions costs or in conveying information about customer requirements back along the chain to producers. The latter is particularly a concern when attempting to produce differentiated products.

Vertical integration is pursued by companies that wish to take control of a supply chain. In a vertically integrated supply chain all decisions are made by the one organisation. Vertical integration can lead to a supply chain that functions more efficiently. However, this is not inevitable. For one thing, the integrating firm may stray into activities that are outside its core competencies. Other potential problems include *bureaucratic cost* associated with trying to centrally control several stages of the food system, *flow balancing* problems as well as *reduced flexibility*.

Contracts may be either *explicit* or *implicit*. Explicit contracts are legal written documents, whereas implicit contracts are handshake deals. Contracts contain both coercive and cooperative provisions. In general, the explicit contracts tend to be more coercive than cooperative, and the more detailed the contract, the more coercive it is likely to be. The basic problem with legal contracts is that it is impossible to incorporate all the dimensions of a future relationship in a legal document (what economists call *bounded rationality*). Attempts to do so limit the flexibility of the contract. As a result, many business relationships are based on verbal (handshake) agreements rather than legal contracts. These allow for more flexibility and hence can be more efficient provided the players do not engage in opportunistic (and exploitative) behaviour. Opportunistic behaviour is less likely to occur in longer-term relationships and where cooperative efforts (i.e. socialisation and trust-building) have been employed.

Horizontal coordination

Horizontal coordination involves the coordination of participants at a particular stage of the agrifood production-marketing system. A schematic of various approaches in order of increasing horizontal coordination is presented in Figure 12.6 below.

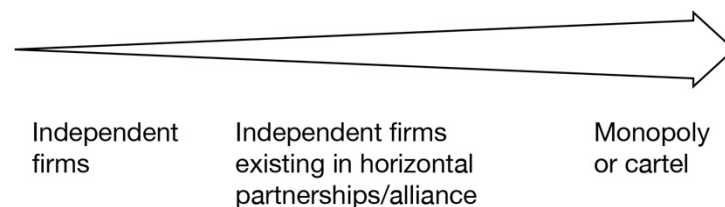


Figure 12.6. Differing levels of horizontal coordination

The highest level of horizontal coordination is a monopoly or cartel while the lowest level is characterised by many *independent* firms operating in a perfectly competitive environment. In between these extremes are *interdependent* firms existing in horizontal partnerships/alliances such as cooperatives or producer groups.

Horizontal alliances are most likely to be established when mutual benefits can be clearly identified and boundaries of the alliance can be well defined. For example, small wine producers, who may be active and aggressive competitors on the local market, may collaborate in exporting, using the region where the grapes are grown as the promotional theme. Among the most popular forms of horizontal alliances in the agriproduct system are *agricultural cooperatives* and *producer groups*.

Agricultural cooperatives

A cooperative is a legal entity established to do business on behalf of its members. The main principles of cooperatives are:

- open membership
- democratic control
- limited interest on shares
- dividends to members on the basis of patronage

Traditionally, agricultural cooperatives have emerged in a number of countries in response to a perceived economic injustice. A major perceived injustice is the relative lack of market power of farmers when it came to buying inputs or marketing agricultural commodities. Traditional cooperatives are self-help organisations but they are also subject to a life cycle. In

the early days of a cooperative's life, member loyalty tends to be strong and this is a significant factor in helping it to early success. However, traditional cooperatives are prone to particular weaknesses. Two of the major ones are the problems of capital accumulation and management control. *Capital accumulation* is a challenge because remuneration is based on patronage rather than investment. Thus the signal to members is to maximise their use of the existing capital rather than to make new investments in buildings, plant and working capital. *Management control* is another challenge because member directors often seek to play a more proactive role in the day-to-day management of the cooperative's activities. Their community orientation may make it difficult to penalise members who do not meet quality standards. Cooperative problems often come to the surface with second- and later-generation members, who do not have the same degree of loyalty as the earlier members. They are more concerned with getting the best value for money, and if the cooperative cannot provide it they go elsewhere.

In recent years, there has been a re-emergence of interest in cooperative marketing arrangements in agriculture. This is probably in part due to marketing deregulation and the declining role of statutory marketing especially in the grains industry. However, *entrepreneurial cooperatives* are also seen as playing a role in the new more highly coordinated supply chains. These cooperatives are characterised by highly professional management who work with the members to provide discerning buyers with a reliable supply of an agricultural product in the required quantity and according to the buyer's particular specifications. These entrepreneurial cooperatives are more market oriented and less community oriented.

One particular type of entrepreneurial cooperative is the *new generation cooperative* which has recently become popular in the American midwest as an organisational structure that facilitates farmers moving into value adding activities (e.g. milling and processing). Value adding activities typically require a significant capital investment, something that is problematic for most conventional cooperatives. The new generation cooperative overcomes this problem by issuing shares to members. Unlike the membership shares of conventional cooperatives, the shares in a new generation cooperative involve a significant cost to the individual member but they also are intended to provide a significant dividend, assuming the cooperative makes a profit. These shares not only give members the right to deliver their agricultural output to the cooperative for value adding, they also involve an obligation to deliver. Thus, for example, a member may have purchased 1000 shares in the cooperative at a cost of \$10/share. For each share, the member may be required to deliver, and the cooperative must accept delivery of, 1 tonne of grain according to specification. The farmer member receives payment on delivery of the grain and also shares in any dividends that accrue from the value adding activity.

Producer groups and related organisational forms

Cooperation in agricultural marketing extends beyond cooperatives, to various types of partnerships, business franchises, joint ventures and working agreements, which also involve non-individualistic behaviour.

Dodds (1967) describes *producer groups* as "horizontally integrated groups of farmers who cooperate through following a common marketing strategy with harmonised production systems". Barker (1989) explains that such groups are often smaller and more commercial than traditional cooperatives in the sense that they are not 'tied to the standards and welfare of the least efficient'. Dodds (1967) suggests that the marketing philosophy behind marketing

groups is that production should be oriented to meet the requirements of the market and that members of the group must accept restrictions on individual action to achieve group objectives. Such groups are selective in their membership who, consequently, are more homogenous and more committed than members of traditional cooperatives. Hence, marketing groups are similar in business culture to the *entrepreneurial cooperatives* and have some characteristics in common with *new generation cooperatives*. However, they may be organised using a company structure rather than a cooperative one.

Developing a niche market

This constitutes a broad area of study and it is only possible here to give a brief introduction. The development of niche markets for differentiated products is traditionally thought to be the domain of processors and retailers, but it is increasingly involving primary producers, acting individually or in a group, who are looking to add value to their basic commodity.

There are three basic questions to be asked in developing a marketing strategy for a differentiated product.

1. Who are my customers?
2. What do they really want?
3. How am I going to reach them?

Question 1 is concerned with *market segmentation* (i.e. determining the target market), while Question 2 is concerned with *product positioning*. Products are positioned in the market place to suit the needs of the consumers in the target group. It is about creating an image in the minds of potential consumers about the important characteristics of the product. Ideally, the product will be positioned where there is not a lot of competition. Hence product positioning is at the heart of *product differentiation*.

Note that *product positioning* and *market segmentation* are different concepts. Whereas *market segmentation* is based on the characteristics of the buyers, *product positioning* is based on the characteristics of the product. Consider the case of a vegetable oil (say, mustard seed oil) with certain health properties (low in saturated fats). The relevant market segment might be sophisticated, health conscious consumers, while the product might be positioned in this market as a product with considerable health benefits at a premium price.

Question 3 is concerned with marketing strategy. There are four basic elements of this strategy - things that can be strategised about to help reach the target consumer. These are: *product design, pricing, promotion* and *distribution channels*. Together, they are known as the marketing mix.

Each of these elements is discussed briefly below. However, no attempt should be made to answer the above questions without first conducting *market research*.

The role of market research is to make better decisions about the target market, the positioning of the product and the development of the marketing strategy. It provides useful information to reduce the risk for managers who must make rational choices under uncertainty. It also provides an information base that will be useful in evaluating performance and finding new markets. There are two types of market research: *primary* and *secondary* research. One should start with secondary research. This is information already compiled and often available free or at minimal cost (e.g. from the local Chamber of Commerce, Australian

Bureau of Statistics, private company sales). This may be followed by primary research in the form of consumer surveys, focus groups or test marketing.

Product design

A product is a complex of tangible and intangible attributes including:

- (a) *product attributes* – sensory (chewiness of pasta, aroma of wine, crunch of an apple, softness of a peach, texture of a woollen garment), nutritional, safety, use and convenience and storage life;
- (b) *packaging* - which protects (from elements and foreign objects), promotes (describes product qualities and attracts consumer's eye), brands (differentiates product using symbols that are easily recognisable), educates (nutritional values and cooking information) and satisfies government regulations (ingredients, weight, volume, manufacturer's name and address);
- (c) *services* – which may include a money-back guarantee, the provision of prompt and courteous service, and access to services such as recipes and special offers.

Any change in the product design no matter how small (e.g. a change in the packaging) creates a 'new' product. So long as the consumer sees a difference, then there is a difference.

Modifying this element of the marketing mix may allow options such as:

- offer an existing product in a more convenient size (smaller or larger);
- develop a new product;
- develop a private store brand;
- develop a product for a special time of the year;
- bundle products together.

Price

Price is established whenever there is a change of title (i.e. ownership) of a product as it moves along the supply chain. For differentiated products, price strategy may be influenced by internal factors (e.g. marketing strategy and costs) or external factors (e.g. nature of customers, competitors, industry structure, legal issues, and product characteristics and positioning). This is in contrast to commodities, where producers are 'price takers' and external factors dominate in determining price.

There are two basic approaches to pricing: *cost-oriented* approaches (mark-up pricing and pricing to achieve a target return on investment) and *market-oriented* approaches (perceived value pricing and going rate pricing). These alternative approaches are briefly discussed.

Mark-up (or cost-plus) pricing is intended to provide a per unit profit outcome by adding a certain percentage on to the cost of production. Suppose the per unit cost of a product is \$4/unit and the profit required is \$1/unit, then the mark-up is 25%. Target return on investment (ROI) pricing is a variation on mark-up pricing in which price is set to cover the total cost of production and then something is added to cover a target ROI. These two methods of pricing are quite common, but both lack any real logic. They fail to take into account competitors, the nature of demand and the effect of volume on profits. What happens if costs go up, but demand does not? The product could be priced out of the market.

Market-oriented approaches to pricing address this deficiency. These are based on the idea that costs are of secondary importance rather than of primary importance. The two main approaches are *perceived value pricing* and *going rate pricing*. As its name suggests,

perceived value pricing is based on consumer perceptions of the value of the product. This may be determined by a combination of market research and testing alternative price levels. It may also be influenced by changes to factors under the control of the manager (e.g. positioning strategy, promotion, and product design). Going rate pricing involves using the price of a major competitor as a benchmark. Price is set either at the same level, or a little higher (premium) or a little below (discount). This is popular not just because of its simplicity but because it reflects the collective wisdom of the industry and reduces the risk of price wars.

While either of these market-oriented approaches provides a useful basis for a pricing strategy, the resulting prices may be modified by other considerations such as:

- survival – price below cost to maintain cash flow
- increase market share or defend current share - through penetration pricing (i.e. deep discounts to ward off competitors).
- market skimming – high price in early stages of product life cycle when there is little competition followed by lower prices later on to keep competitors at bay
- price branding – intended to signal a product's position in the market. Often used for products like wine to signal quality. For example, a bottle of wine priced over \$25 signals a good wine while a \$10 bottle signals a mediocre one.

Promotion involves the many post-production activities that are concerned with *communication* with potential customers. There are four major tools of promotion: three that focus on product promotion (advertising, sales promotion and personal selling) and one that focuses on promotion of the company (public relations). These are discussed briefly.

Advertising is defined as any paid message distributed by public media (e.g. newspapers, magazines, radio, TV, outdoor signs) designed to raise awareness of the product.

Sales promotion is the making of a featured offer to defined customers within a specific time limit. It is often confused with advertising but the two are conceptually distinct and may or may not operate together. For example, consider the example of a *price markdown*. This in itself is a sales promotion activity. It is possible to offer the price markdown without advertising, though this is likely to have limited impact. Advertising can be used in conjunction with the sales promotion (the price markdown) to raise public awareness of it. There are two basic strategies associated with sales promotion: *push* and *pull*. The push strategy involves pushing the product onto the retailer. The pull strategy involves encouraging final consumer to pull (demand) the product from the retailer.

Examples of a push strategy include:

- price discounts to the retailer;
- volume rebates to the retailer;
- inventory financing;
- direct payments for shelf space (slotting allowances).

Examples of a pull strategy include:

- money-off coupons
- consumer trials
- prize competitions
- in-store demonstrations (by the firm interested in promotion)

The pull strategy works best when brand loyalty is high. If brand loyalty is low, the pull strategy could be an expensive failure. For example, a corn chip manufacturer may conduct an in-store

demonstration of its corn chips, but if this only stimulates consumers to buy more savoury snacks then it is ineffective.

Personal selling This involves personal interaction with a potential customer (unlike advertising and most sales promotion). This is the most expensive form of promotion and is best used for complex, high-valued products (e.g. cars, trucks, and designer clothes). Thus, it is not used much for food products that tend to be relatively non-technical and low-valued.

Public relations This is the way a company organises its relations with its public (community at large, employees, customers, suppliers, money market, distributors, and opinion leaders). A company may do well on the product promotion, but can lose sales if it does not pay attention to PR. For example consider the case of companies which did business in South Africa during the apartheid years or those which are not environmentally or animal-welfare friendly. Their sales have been adversely affected with boycotts by political action groups.

Distribution channels are the ways in which products may be distributed. One possibility is for the producer to market directly. This is the case with an apple grower who operates a roadside stand, or with Dell computers that markets by mail order, or with Amazon books that markets via the Internet. In these cases, the distribution channel is producer to consumer. However, direct marketing is more the exception than the rule. It is more usual for the producer to operate through one or more intermediaries. An intermediary is an independent firm that operates as a link between the producer and final consumer or industrial user. If an electronics manufacturer sold its products to a department store that in turn sold to final consumers, the distribution channel would be producer to retailer to consumer.

The distribution channel for a product extends only to the last person who buys it without making any significant change in its form. Thus a distribution channel for wheat might be farmer to grain merchant to flour mill. Thereafter, a new distribution channel starts involving flour and this channel may be flourmill to retailer to final consumer.

A distribution channel might include one or more of the following intermediaries:

- producer's agent
- wholesaler
- retailer

An agent may be used by small producers who do not have marketing skills or cannot afford the time to market their own production.

A wholesaler may be used by small retailers who do not have the time or skills to source their own supplies directly from producers.

A retailer is typically used where the distribution channel ends with the final consumer (as opposed to an industrial user).

Some examples of distribution channels involving final *consumers* are as follows:

1. producer-retailer-consumer (large retailer buying fruit and vegetables direct from a producer)
2. producer-wholesaler-retailer-consumer ('traditional' channel for small producers and small retailers)
3. producer-agent-retailer-consumer (small producers and large retailers)

4. producer-agent-wholesaler-retailer-consumer (small producers and small retailers).

There is an analogous set of 4 distribution channels involving *industrial users* (e.g. a flour mill or corn chip manufacturer). The only difference is that the retailer is no longer involved. Thus, the distribution channels become:

5. producer-industrial user
6. producer-wholesaler (industrial distributor)-industrial user
7. producer-agent-industrial user
8. producer-agent-wholesaler-industrial user

Historically, distribution channels involved individual channel members acting independently. However, as we have described earlier, with the *new agriculture* revolution, this is changing. The vertically coordinated production-marketing system has become a major force on the agrifood landscape. This system is characterised by tightly coordinated distribution channels designed to achieve operating efficiencies and marketing effectiveness.

SUMMARY

If this chapter had been written 10 years ago, or perhaps even 5 years ago, it would have looked very different. It would have focused much more extensively on *commodity marketing*, with perhaps some reference to alternative institutional arrangements (e.g. cooperatives and marketing boards). There would have been little or nothing on *differentiated product marketing*. However, the megatrends witnessed recently in the agrifood sector have helped usher in a revolution in the agrifood sector, the so-called *industrialisation of agriculture* or *new agriculture*. This, in turn has led to a rise in importance in differentiated product marketing, a new dimension in crop marketing.

From a marketing perspective, the main difference between *commodity marketing* and *differentiated product marketing* is the nature of marketing strategy. In the case of differentiated products, an individual producer (or a producer group) may develop a marketing strategy around a mix of elements (product design, price, promotion and distribution channels). However, in the case of commodities these elements are determined externally to the individual producer (or producer group) and hence are not available for use in their marketing strategy. For example, price is typically determined by the market and is not a choice variable of the individual producer.

What then should be the focus of a marketing strategy by producers who market their output as an undifferentiated commodity? The management of price risk is the most appropriate. Agricultural commodities are characterised by inelastic demand and supply (i.e. steeply sloped supply and demand curves). This means small shifts in either the supply or demand curve results in large movements in price. This is recognised here by focusing first on the issue of price determination in commodity markets and then on the question of managing price risk. Futures markets and options markets as institutions that allow producers to manage price risk have been discussed.

The marketing of differentiated products has been evaluated. First, the megatrends that have led to the growing importance of differentiated product marketing have been examined. They were: (a) the megatrend of demand - the changing requirements of the consumer; (b) the megatrend of supply - the technological advances that have opened up innovations in agricultural production, food processing, food distribution and communications (for information and exchange); and (c) the megatrend of government – attempts to limit

agricultural protection. Also examined were the production-marketing system for agrifoods to show how this was evolving to meet the needs of differentiated products. Finally, examination took place of marketing strategy for the producer of a differentiated product. This was couched in the three strategic questions: Who are my customers? What do they really want? How am I going to reach them?

Crop marketing is important. There is no point producing something that cannot be sold. In the past, crop marketing has been synonymous with commodity marketing but, in the future it will be synonymous with either *commodity marketing* or *differentiated product marketing*, depending on the situation. An overview of these two dimensions of crop marketing has been provided. With the growing *industrialisation of agriculture*, the agrifood sector in general and the crop sector in particular will provide many exciting new challenges and opportunities for the world of marketing.

PRINCIPLES

- Marketing of field crops has traditionally been concerned with the sale of *undifferentiated commodities* (e.g. ASW wheat).
- The marketing strategy for undifferentiated commodities has centred on price: what are the determinants of price (i.e. the determinants of supply and demand) and how can one protect against adverse price movements (e.g. through hedging on futures markets or buying option contracts)?
- In recent times, there has been an upsurge of interest in the marketing of *differentiated products*. These include field crops produced to specification under contract for a particular buyer.
- The growth of interest in differentiated products is associated with megatrends in the global food industry including increasing consumer demands for quality and safety in the foods consumed. This has resulted in the so-called industrialisation of agriculture (or New Agriculture).
- In the New Agriculture, arms-length business dealings are being replaced by highly coordinated supply chains characterised by partnerships and strategic alliances.
- The marketing strategy for differentiated products is more complex than that for undifferentiated commodities. For differentiated products, price is only one of a number of elements to consider.
- With regard to price, this is a choice variable for producers of differentiated products but it is determined in the open market for producers of undifferentiated commodities.
- Other elements of marketing strategy for differentiated products include product design, promotion and distribution channels.
- Because of the complexity of choice of marketing strategy for differentiated products, it is important to undertake market research (primary and secondary).

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