

# Chapter 18

## Principles of Economics and Marketing



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## Introduction

The potato market is a complex, dynamic economic system. It can be viewed as a chain linking producers on one end to consumers at the other. Fresh packers, processors, wholesalers, transporters, retailers, and restaurants make up some of the other links in the chain. The information presented here is mostly from the growers' perspective, but it should also be useful for potato science students.

This chapter provides a general overview of the potato market. Although it begins with a discussion of grower marketing decisions, it is not a "how to" guide. Instead, it is a reference for potato marketing principles and issues.

## Grower Marketing Decisions

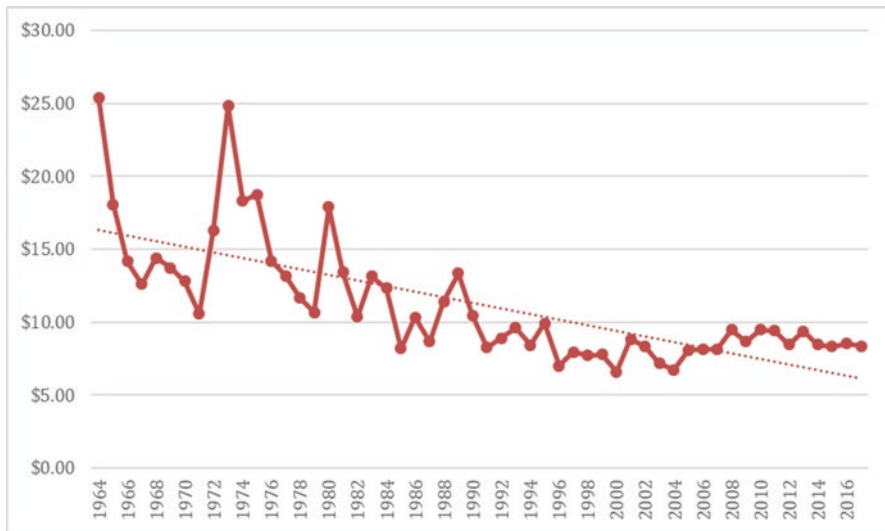
Potato growers make many decisions during the production and marketing of a crop of potatoes. Management decisions for producing a crop of storage potatoes may be spread over nearly 2 years. The decision to grow potatoes in a particular field may need to be made during fieldwork the previous fall. The decision-making process continues through variety selection, planting, irrigating, fertility management, pest control, vine kill, harvest, storage management, and the sale, which could be as late as August the year after harvest. Some decisions are based entirely on marketing factors. Others may seem to be production decisions, but if the results impact product quantity and quality, the choices have implications on marketing.

### *What to Grow*

The first marketing decision is whether to plant potatoes. If the answer to the first decision is "yes," the next decisions are where and how much to plant. Potato production is an expensive, risky enterprise that requires the right soil, climate, equipment, finances, labor, management, and marketing opportunities to be profitable. Potato producers who are thinking of entering, continuing, or expanding potato production should understand two important things:

1. Most potatoes are a commodity.
2. Historically, commodity prices trend downward.

Figure 18.1 shows more than a half-century of U.S. potato prices. After adjusting for inflation, potato prices trended downward until flattening in recent years.



**Fig. 18.1** U.S. potato price trend, 1964–2017 (1983 dollars)

Growers who intend to be in potato production for the long run should be prepared to reduce costs per unit in order to survive on downward-trending prices.

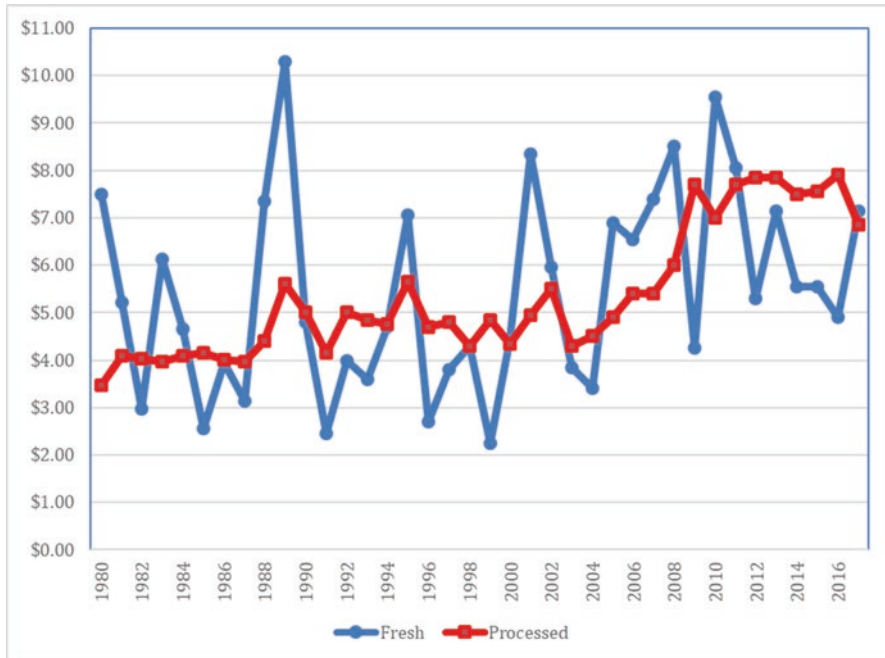
In the future, one way for potato growers to get out of the commodity business is to grow private varieties. Public varieties, such as Russet Burbank, can be grown by anyone without paying royalties. As a result, public varieties become commodities with, of course, downward trending prices.

Recent changes in property rights law and biotechnology have opened doors to privately owned varieties that indeed can be value-added, branded products if consumers view them as a superior good. With the supply of such varieties controlled by the owner, the excess supply problem that forces commodity prices down is a less powerful force. Growers can own varieties themselves or join alliances with others who hold varietal property rights.

Potato growers have many choices of public varieties. Market opportunities should be factors in grower variety selection decisions. The Russet Burbank has long been popular because it is a dual-purpose variety—well suited for both fresh and processed markets. Growing varieties that are suitable for only one mainstream market may be risky because of restricted marketing options. A single-purpose variety should have characteristics that make it well suited for market and production conditions.

### ***Where and How to Sell***

Producers who have not grown potatoes, and those who are considering expansion, should first think about where and how they can sell the potatoes they will bring to market. The main choices of market outlets are fresh, processed, and seed. More discussion of these choices follows in the Market Channels section later in this chapter.

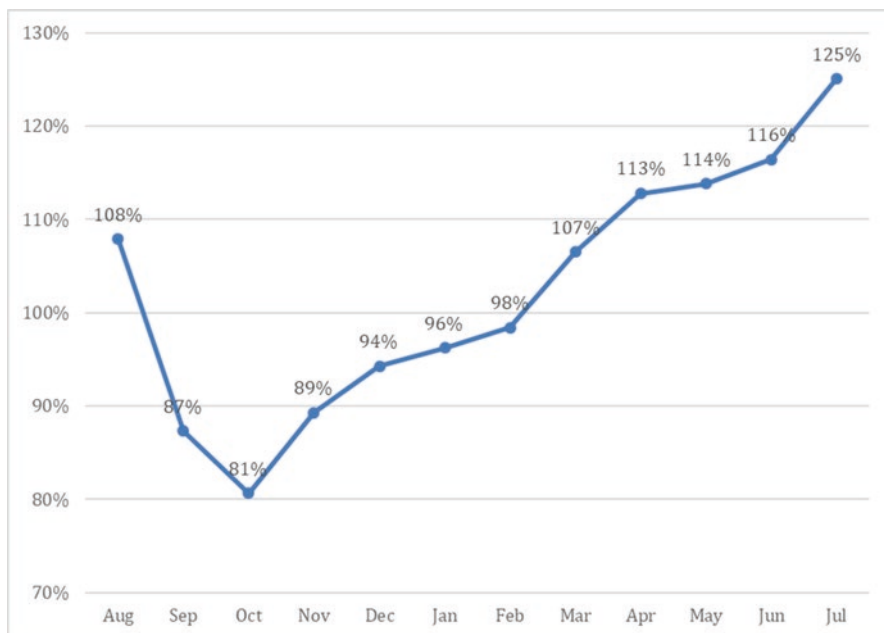


**Fig. 18.2** Idaho fresh and processed potato prices, 1980–2017

Transport economics may be an important factor for some growers in the where-should-I-sell decision. Trucking potatoes long distances to a fresh packer or processor may put growers at a competitive disadvantage. Custom haulers in the main potato-producing regions can provide estimates of the costs for hauling to market.

The how-should-I-sell choices are generally limited to the open market or contracts. The open market offers the opportunity to sometimes sell at high, profitable prices, but the tradeoff is the risk of selling at low, unprofitable prices. The fresh potato channel has traditionally operated with open-market pricing. The processing industry contracts with growers for a large share of their raw product needs, but they also rely on the open market for some purchases.

Contract prices are more stable than open-market prices, but still vary from year to year. Figure 18.2 shows Idaho fresh and processed average annual prices. One example of price variability is in 1989 when the fresh market average price was \$10.30/cwt and the processed price was \$5.60. Two years later the fresh price had dropped to \$2.45, and the processed price fell by a lesser amount to \$4.15. For the entire 1980–2017 period, the fresh price average was \$5.43, and the processed price average was not much lower at \$5.34.



**Fig. 18.3** Seasonal price patterns for U.S. fresh potatoes

## *When to Sell*

Potato growers who contract with processors can sign contracts that call for delivery at harvest or during the storage season. Growers with their own storage facilities can estimate monthly storage costs and determine the type of contract they prefer. See Chap. 19.

Open-market growers should also estimate their storage costs, but they face the additional challenge of market uncertainty. For many fresh potato growers, the decision of when to sell can have huge financial implications, especially during years when open-market prices are quite volatile.

Figure 18.3 shows how U.S. fresh potato prices moved, on average, within the calendar years from 1980 to 2017. The percentages for each month measure that month's price in relation to the average price for the entire marketing season. For example, the October price is the lowest at 81% of the season average. That makes sense because that is when most potatoes are harvested, and the market supply is at its peak. Prices then rise steadily to a high in July of 125% of the season average.

Figure 18.3 shows averages only. In general, prices rise during the storage season or growers would not store for the open market. During some years the lowest prices of the season, not even accounting for storage costs, are at the end of the season. During other years, growers who sold at the end of the season reaped very profitable prices.

The challenge for growers is to estimate storage costs and try to sell when the storage enterprise shows a profit. They must do that without futures markets—a tool that producers of other commodities can use to lock in prices before delivery.

## **Principles of Economics and Marketing**

### ***Demand***

In a free-market economy, the consumer is queen or king. Decisions made every day by consumers in grocery stores and restaurants drive the entire food production and marketing systems.

Price rations supply in a free-market system. When growers produce a small crop of potatoes, consumers bid up the price for the scarce good. Those who are willing to pay the higher price get the potatoes. When growers produce a large crop, potatoes are plentiful and can clear the market only at lower prices.

How consumers respond to changing prices is an important economic concept. For potatoes, consumers tend not to be responsive to price fluctuations and will buy about the same amount regardless of price, causing small supply reductions to push prices to high levels. Of course, it works the other way as well. A small increase in potato production can cause a large decrease in price. Researchers have found that a 1% increase in fresh potato supply can cause prices to change in the opposite direction by 7%.

In addition to price, other factors influence consumer demand. These can be grouped into four major categories, known as demand shifters: (1) population, (2) income, (3) prices of other goods, and (4) consumer tastes and preferences.

When a demand shifter causes an increase in potato demand, potato producer revenue increases. Consumers will purchase more potatoes at the same price or at a higher price.

### ***Population***

The U.S. population grew about 1% each year during the 1990s. The U.S. Census Bureau predicts that annual population growth is about 0.8%. This means that if nothing else changes, potato demand will slowly increase because of U.S. population growth. Although this is important, the characteristics of people making up the population also influence potato demand.

Demographics are the characteristics of population groups. People with northern European ancestry who live in the northern U.S. eat more potatoes than other ethnic groups. Age is another demographic. Young people eat many frozen potato products, mostly in the form of fries eaten away from home. Older people eat more fresh potatoes. As the baby boomer generation ages, their changing food preferences could influence the demand for some potato products.

## ***Consumer Income***

Price affects potato demand, but the impact varies across products. As income increases, consumers are likely to purchase more meals away from home. This increases demand for fries in fast-food restaurants, also known as quick-service restaurants (QSRs), but can decrease demand for fresh potatoes consumed at home.

## ***Prices of Other Goods***

This can have either a positive or a negative impact on potato demand. If the price of a substitute, such as rice, increases, the demand for potatoes increases because some consumers will switch from rice to potatoes. Researchers have found that the closest substitutes for potatoes are other potato products.

If the price of a complement, such as hamburgers, decreases, it too will cause potato demand to increase. When the worldwide fast-food restaurant chain McDonald's reduces its hamburger prices, people eat more fries with the less costly burgers.

## ***Consumer Tastes and Preferences***

These also influence potato demand. Families with both parents working outside the home tend to choose convenient food products. They purchase more services with their food, such as fries prepared at a fast-food restaurant. Another powerful trend is a preference for food that is healthy, such as fresh fruits and vegetables.

## ***Advertising and Promotion***

Firms and industries spend a lot of money attempting to change consumer tastes and preferences. If successful, increased sales revenue from higher prices and/or quantities more than pays for advertising and promotion.

Newspaper ads that feature a supermarket's potatoes, television ads that show people happily eating McDonald's fries, and magazine ads that feature a restaurant's Idaho baked potatoes are some examples of advertising by consumer-oriented businesses (Fig. 18.4). This is called "brand advertising." The businesses want consumers to come to their store or buy their particular potato product.

Potato growers are involved in another type of advertising. They use generic advertising to try to increase demand for all potatoes rather than one particular brand. The U.S. Potato Board collects money from potato sales to fund programs



**Fig. 18.4** McDonald's television advertising featured some of its potato growers, including Frank Martinez in Washington State



**Fig. 18.5** Potatoes USA develops generic potato promotion programs at sports events, including Ironman triathlons

designed to increase demand for all potatoes (Fig. 18.5). The Idaho Potato Commission and other state organizations do the same to attempt to increase demand for potatoes grown in their state (Figs. 18.6 and 18.7).

During tough economic times, some business firms reduce or even eliminate advertising expenditures. These occurrences may be a matter of trading long-run increases in demand for short-run survival. When potato prices are low, some





**Fig. 18.6** A displays calls attention to the “Grown in Idaho™” brands of potatoes and entice shoppers to purchase fresh potatoes



**Fig. 18.7** The Idaho Potato Commission conducts national advertising campaigns, including a multi-year program featuring a giant Idaho potato hauled by an 18-wheeler

growers talk about cutting the advertising funding mechanism for the same reason—to keep more money on the farm in the short run. Some are willing to accept lower prices in the future for short-run savings.

Advertising and promotion should be evaluated in terms of return on investment. For potato industry groups, it is a matter of putting money into programs that give



**Fig. 18.8** Potatoes USA international marketing programs increase the global demand for US potatoes

the most return for the investment. For example, if running a promotional program on fry management for Asian fast-food restaurant managers provides a larger return than the same money spent on television time in a U.S. city, that is where the advertising money should go (Fig. 18.8).

Potato snack food processors use brand advertising to increase demand. Frito-Lay®, the top potato chip firm in the world, has a long history of effective advertising that helps build the value of the brand. Advertising among frozen potato processors is less common, but some feature their sustainability programs (Fig. 18.9).

## *Supply*

Potato prices are sensitive to changes in supply within a given production year. Potato prices influence the amount of potatoes produced the next year. When potato prices are high throughout the marketing year, growers tend to plant more potatoes the following spring. They may not plant a lot more, but it takes only a small increase in supply to make a big change in price. High prices also entice other farmers, or even people who have never farmed, to plant potatoes. Economists call this behavior the “naïve price expectations model.” See Sidebar 18.1.



**Fig. 18.9** Potato processors include environmental messages in their marketing programs

### Sidebar 18.1: Naïve Price Expectations

Since small decreases in supply cause large price increases, all the potato industry has to do is keep the supply down and prices will be profitable. Sounds simple doesn't it? It's not.

Naïve price expectation is one reason this is not so simple. Prices serve valuable purposes. First, they are needed to complete transactions between sellers and buyers. Second, they are signals. Our lives are full of signals. Traffic light signals tell us when to stop, when to go, and when to use caution. Alarm clocks signal people when to wake up. The referee's whistle signals when to stop the sporting event.

What do prices signal? They signal when to increase or decrease production. People in a free market read a high-price signal as an opportunity to make money. So they produce more. A low-price signal sends the opposite message; to grow less.

Each year the potato market sends new signals. Some growers don't trust the signals and stick to their rotations, but others do respond. The problem comes when a high proportion of growers responds to high-price signals. They seem naïve—which *Webster's Dictionary* defines as, "lacking critical ability or analytical insight."

Don't potato growers know that larger supplies drive down prices? Sure they know it, but they can't resist. The signal light has turned green.

Although individual grower behavior is unpredictable, the overall market impact is that higher prices bring higher plantings. Of course input costs, other crop prices, seed availability, processor contracts, government policy, and weather also influence plantings. Growers may see conflicting signals, but the price they received for their last crop is usually the strongest signal.

Some business people operate under a contrary principle. They try to make decisions that are the opposite of others in their industry. Contrary potato growers plant opposite the price signals. Realizing that naïve price expectations will influence the price of the next crop, contrary potato growers decrease plantings when prices are high and increase plantings when prices are low.

### **The Costermonger's Lesson**

Long ago in England a new type of apple was developed—the costard. The new variety became so popular that the people who sold apples from their carts became known as costermongers.

The costermongers discovered an important economic principle that applies to modern produce markets—branding by variety increases demand. The apple vendors of old England realized the economic advantage of showing the good things about each variety to consumers.

The costermongers of today are supermarkets. They understand the lesson from the costermongers of old. You can see it in their fresh produce departments, where they display apples by variety.

Variety branding creates economic opportunities for growers to get out of the commodity business, where prices trend downward. You can see those opportunities in apple prices paid to growers.

The lowest apple price is usually for the Red Delicious, a variety that has a lot in common with the Russet Burbank potato variety. Both varieties date back to the 1870s when they were discovered as mutants. After 130 years, Red Delicious and Russet Burbank are still the most popular varieties among growers, but they are also public varieties that are in excess supply.

Apple growers are ripping out old Red Delicious orchards to plant varieties that bring higher prices. They have the opportunity to produce higher-valued apples because the industry brands by variety all the way to the consumer.

One apple variety that sells for high prices is Cameo, a private variety. An apple grower discovered Cameo as a chance seedling in the 1980s, protected it, and trademarked the name. Owners of this variety can control the supply and prevent it from becoming a commodity.

Meanwhile fresh potato varieties continue to be sold as commodities. They are red, white, russet, or yellow, but they are still commodities. The lesson from the costermonger says there is an economic advantage to branding by variety at the consumer level.

Researchers have found that the previous year's potato price does indeed influence supply the next year. It may not be that growers are truly naïve, but they get optimistic when prices are profitable and pessimistic when they are not. Non-price factors that influence supply include seven supply shifters: (1) input costs, (2) alternative crop prices, (3) technology, (4) joint product prices, (5) risk, (6) government programs, and (7) weather and pests.

### ***Input Costs***

Variable production costs, such as for seed, fertilizer, chemicals, and energy, can influence the supply of potatoes. The high fixed costs of entering the potato growing business are also a consideration. Large investment in specialized potato equipment (e.g., planters, harvesters, and storage buildings) create “asset fixity.” Since these investments are “fixed” into potato production and are not easily used for other crops, growers who own them are likely to plant potatoes year after year.

### ***Alternative Crop Prices***

Commodity prices for other crops influence potato supply. High grain prices tend to increase grain plantings and reduce potato plantings. Different crops influence potato plantings in different parts of the country. Prices of wheat, barley, corn, alfalfa, sugar beets, onions, and other vegetable crops all affect potato plantings in some parts of the U.S.

### ***Technology***

Acreage planted is only half of the potato supply puzzle. Yields are the other half. Technology is an important force in the potato yield situation. Advances in irrigation and nutrient and pest management have helped growers increase yields so that they can grow more potatoes on fewer acres. Precision agriculture and biotechnology can also help yields increase.

U.S. potato yields have long been on an upward trend (Fig. 18.10). For the 1980–2018 period, average annual increases were 4.7 cwt/ac. A shift in potato plantings from low-yielding, non-irrigated areas to high-yielding irrigated areas has contributed to yield increases. Also, field selection decisions may be a factor, as growers choose to plant potatoes only in high-yielding fields well suited for potatoes.

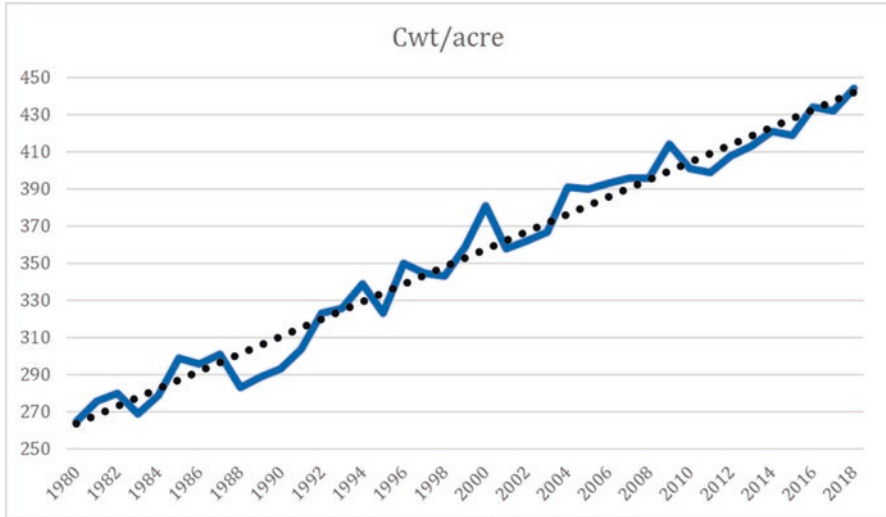


Fig. 18.10 Trends in U.S. potato yields, 1980–2018

### *Joint Product Prices*

The sheep industry, which sells lambs and wool, is often cited as an example of the fourth supply shifter. In the Pacific Northwest (PNW) potato industry, fresh and dehydration markets have similar relationships. When Idaho growers sell open-market potatoes to fresh shippers, some go fresh, but the off-grade potatoes go to dehydrators. The growers may be paid a scoop-up price, but a joint product relationship is built into it. A high price paid by dehydrators for off-grade potatoes can increase the supply (planted acreage) of fresh potatoes the following year.

### *Risk*

Potato growers face two types of risk: (1) production risk and (2) price risk. Growers who can reduce some of the production risk may choose to expand potato production. Increased risk can have the opposite effect. For example, when late blight first became a pest in the 1990s in Idaho and Colorado, some growers reduced plantings.

Price risk can be reduced with processor contracts. Researchers found that increases in potato contract prices cause increases in potato plantings. Even though acreage contracted may not change, the higher contract price reduces the risk of financial losses for individual growers, encouraging them to plant some open-market potatoes.

Open-market growers and contract growers seem to have different risk attitudes. Growers who prefer the volatility of the open, fresh market are willing to trade off the risk of low prices for the opportunity to sell at high prices.

### ***Government Programs***

Government involvement in the potato market has been relatively minor in recent decades, but programs designed for other crops do influence the supply of potatoes. For example, when the government removes price supports for wheat, some growers will switch wheat acreage to potatoes. When potato prices are disastrously low, the federal government sometimes provides support in the form of potato purchases or direct payments. This may help financially strapped growers survive, but it could increase potato supplies in following years.

### ***Weather and Pests***

Since potato prices are sensitive to changes in supply, market analysts closely watch conditions in potato-producing regions. Some forecasting models use weather variables to help predict potato supplies. Growers joke about disasters somewhere else helping the price situation, but they sometimes overestimate the impact of weather problems on potato supply. Potato plants are tough survivors that can produce higher-than-expected yields despite problems, such as frost early in the growing season.

### ***Market Structure***

Markets for agricultural products may be classified in three categories: (1) competitive, (2) oligopsony, and (3) monopsony. Competitive markets have many buyers and sellers, oligopsony markets have few buyers, and monopsony markets have one buyer.

Competitive markets also have homogenous products, no government intervention, no collusion, no barriers to entry, and accurate market information. Under competitive conditions, both buyers and sellers are price takers. No one individual is large enough to impact price. They all simply accept the prices determined by aggregate market forces.

Fresh potato markets have historically been competitive. Recent buyer consolidations have been a move toward oligopsony, which has long existed for processors. When there are only a few buyers, each one may have the power to influence price.

When a large number of growers sell to a few, powerful buyers they may receive lower prices than they would in a more competitive market.

Growers can gain market power by consolidating their sales. The federal government provides agricultural producers an exemption from antitrust laws. This allows farmers and ranchers to form cooperatives and bargaining associations that create a few large sellers out of many small sellers.

One challenge is getting growers to give up their independence to the organization. Another challenge is to manage the “free rider” incentive for those who want to enjoy the higher prices without paying organization membership costs.

### ***Market Information***

One of the requirements for competitive markets is accurate market information that is available to both buyers and sellers. Since large buyers can afford to assemble market information that individual growers cannot, the federal government provides unbiased market information. This is one example of official U.S. government policy to provide market power to growers.

The U.S. Department of Agriculture (USDA) and its network of state agricultural statistics services produce public information about potato acreage, yields, production, storage stocks, and other relevant market variables. One branch of USDA, the Agricultural Marketing Service, provides daily information on potato prices. The North American potato industry has a long history of private market information and analysis available for a subscription fee.

### ***Pricing Mechanisms***

Farm commodities are sold under five general types of pricing arrangements: (1) individual negotiations, (2) organized auctions or exchanges, (3) formula pricing, (4) collective bargaining, and (5) administrative decisions.

### ***Individual Negotiations/Collective Bargaining***

The most common pricing mechanisms in the potato industry are individual negotiations and collective bargaining. Individual fresh growers negotiate prices with individual fresh shippers. Although little opportunity exists to change competitive price levels, growers decide when and with whom they negotiate terms of sale.

Growers in Idaho, Washington, and a few other states have a history of collective bargaining with processors. When a large majority of growers are united in the



**Table 18.1** Formula pricing example for fresh potatoes

|                        | Share (%) | Price (\$/cwt) |
|------------------------|-----------|----------------|
| 10# Film bags          | 28        | \$12.50        |
| 40-count cartons       | 1         | \$22.00        |
| 50-count cartons       | 2         | \$23.50        |
| 60-count cartons       | 3         | \$25.75        |
| 70-count cartons       | 5         | \$27.50        |
| 80-count cartons       | 4         | \$28.50        |
| 90-count cartons       | 5         | \$25.25        |
| 100-count cartons      | 5         | \$23.00        |
| US# 2                  | 7         | \$14.50        |
| Total/weighted average | 60        | \$18.18        |
| Packing fee            |           | \$6.50         |
| Return for fresh       |           | \$11.68        |
| Processing grade       | 40        | \$4.00         |
| Total grower return    |           | \$8.61         |

association, they can influence commodity prices. If the association represents an inadequate share of production, it has little influence on contract prices.

### *Organized Exchange Pricing*

This mechanism is not available to U.S. potato growers. Potato futures contracts fit into this category, but U.S. futures exchanges no longer offer potato contracts.

### *Formula Pricing*

The pack-out pricing method used by some fresh shippers is a type of formula pricing. With this method, the net price to the grower is a function of shipper prices for each type of pack, percent of the grower's potatoes going into each pack, and a packing cost. An example for a typical Idaho Russet Burbank packout of 60% fresh and 40% processing grade is presented in Table 18.1.

### *Administrative Pricing*

Most potato marketers are "price takers" and do not have the power to set potato product prices. Those who acquire that market power are "price makers." In the public sector, the federal government has the constitutional power to set price floors

**Fig. 18.11** Domesticated potatoes grown in South America have many colors and shapes



and ceilings, but has rarely done that in the potato industry. In the private sector, a firm can set its own prices if it has exclusive property rights, such as a patent, or the market power that comes with large size.

## Market Channels

### *Fresh Potatoes*

For many years fresh potatoes have been a staple in American diets. A traditional evening meal consisted of “meat and potatoes” eaten at home. With the increasing popularity of fast-food restaurants, the traditional meal seems to have shifted toward “burger and fries” eaten away from home. This shift in preferences partially resulted in a decline in per-capita fresh potato consumption in recent decades.

Several market forces could cause fresh potato consumption to increase. Potato packers are providing more convenient products, some of which are easy to prepare in microwave ovens. Successful promotions by Potatoes USA and state grower associations are changing public opinion to an understanding that potatoes are healthy. Still another factor is the large number of restaurants that include baked potatoes and fresh-cut fries among their menu choices.

Fresh market potatoes in North America are classified as russets, reds, and whites, based on skin color. Potatoes sold in North America are traditionally white fleshed. Yellow-fleshed potatoes, however, have been popular in Europe for many years. South American consumers have eaten blue, purple, and even black potatoes for centuries (Fig. 18.11). Although U.S. markets for these “exotic” potato types are small, they are growing, especially for yellow varieties.

Fresh potato sales are made in a variety of containers and grade specifications. Russet potatoes are usually packed in three general size categories: (1) consumer



**Fig. 18.12** Processed potatoes now come in literally dozens of forms and use a significant portion of the commercially grown product

packs, (2) count cartons, and (3) institutional packs. Consumer packs consist mainly of 4–8-oz (non-size A) potatoes packed in plastic, paper, or mesh bags.

The most valuable potatoes are the 8–14-oz tubers that are packed in 50-lb cardboard boxes. These are called “count cartons.” Each carton has a number that tells how many tubers are in a box (e.g., 60, 70, 80, 90, 100, 110, 120). Retail stores and restaurants buy count carton potatoes, which are typically used for baking. Institutional buyers, such as military bases, buy 100-lb bags of large potatoes to minimize packaging, handling, and peeling costs.

Although some reds and whites are sold in the same three size categories as russets, it is more common to pack them in a wider range of sizes in one container. Only the very largest (jumbos) and smallest (B-size) are typically sold separately. The russet consumer packs are usually the closest competitors for the reds and whites.

Some fresh potato production areas have mandatory inspection for fresh shipments. The rules, usually administered through marketing orders, require all fresh shipments of potatoes leaving the state to meet grade standards. Strict quality control has been an important component in some state advertising and promotion campaigns.

### *Processed Potatoes*

Growth in potato processing in the later 1900s was rapid. By 1970 U.S. processed utilization was nearly equal to that of fresh. Major processing uses of potatoes now are chips, dehydration, and frozen-fried, which together account for about 98% of U.S. potato processing (Fig. 18.12).

Location of processing facilities varies according to product form. Freezing and dehydration plants are near growers in the Northeast, upper Midwest, and PNW. In Canada, processing is near producers from east to west along a band close to the U.S. border.

In contrast, potato chip plants are near consumers. Since chips are fragile and their low density makes them expensive to transport, chipping plants are in heavily populated areas. Chip growers are also widely dispersed. Before drought and flood problems, North Dakota was the largest chipstock producer in the U.S. Florida has replaced North Dakota as number one. Other major producing areas include Arizona, central California, Maine, and Michigan, but pockets of chip production are scattered across the continent.

Frozen processor contracts with growers emphasize factors that influence finished product quality. Specific gravity is of particular concern; processors pay premiums for high specific gravity and discounts for low specific gravity. See Chap. 15. Other characteristics, such as level of bruising, as well as tuber size and grade, are subject to incentives and may allow the grower to earn premiums. Contract provisions change in response to changes in technology and production practices.

Contracts allow growers to concentrate on production practices that improve yields and quality. Over time, contracts stabilize grower prices and, to a lesser extent, profits, which are subject to the vagaries of weather.

Frozen processors make fries, hash browns, and other products from the usable potatoes that growers deliver to the plant. The dehydration industry operates differently, purchasing much of its raw product as off-grade potatoes from fresh packers. Growers produce potatoes specifically for frozen and fresh markets, but returns are usually too low to attract growers to specialize in the dehydration market. Future development of varieties designed specifically for high yields of dehydration-quality potatoes could change this situation.

## ***Seed Potatoes***

A small, but important, component of the potato marketing picture is seed. As discussed in Chap. 4, use of high-quality seed potatoes is one of the most important practices in potato production. Most of the seed produced in the U.S. and Canada is used in North America, but some is exported outside the Western Hemisphere.

## **Marketing Issues**

### ***Regional and Seasonal Production Patterns***

North American potato production has been shifting from East to West and from South to North. The East to West shift is the result of several economic forces. First, modern transportation makes it possible for growers in remote regions in the West to compete with growers closer to big cities.

Second, potatoes are less expensive to grow in the PNW because of favorable climate, plentiful irrigation water, few pests, lower power costs, and lower taxes. Another factor is consumer willingness to pay a higher price for what is perceived to be a premium product, such as the Idaho Grown Potato™.

The South to North shift results from enhanced storage technology that lengthened the potato storage season. This allowed frozen potato processing, the most rapidly growing market segment, to operate year-round on northern-grown potatoes, which increased efficiency.

Recent potato expansion in several regions of North America suggest that the trends may have ended. In the future, global markets and mobile resources could mean that potato production shifts could be more rapid than in the past.

## ***Global Markets***

Most potato processing firms began a few decades ago as small operations that sold product in regional markets. Some have evolved into large corporations with global operations. World-wide growth in the popularity of quick-service restaurants (QSRs) has fueled the growth of frozen fry processing. Consumers all over the globe have developed a taste for traditional burger-and-fries meals from North America.

Japan has long been the top customer for U.S. frozen fry exports. Greater China (Mainland China, Hong Kong, and Taiwan) has become another important market and is viewed by some as a major growth market of the future. The rapid growth of the Japanese fast-food industry and U.S. frozen fry exports to Japan may be repeated on a larger scale in China.

On the import side, growth in Canadian frozen fry imports has also been rapid. The unusually high value of the U.S. dollar in relation to the Canadian dollar provided a powerful economic incentive for processors to expand in Canada. And they did, but changes in currency exchange rates continually shift competitive positions.

Expansion of global frozen fry trade is causing a dispersion of processing plants. As more capacity is needed, processors spread their production facilities around the globe. This geographic diversity gives them flexibility to move production according to changes in currency exchange rates, consumer demand, transportation costs, potato yields, and quality.

Global markets provide opportunities not only for QSRs and processors, but also for growers. Many North American growers have expanded their operations along with the growth in the global market. Some have become international growers. Since they have the expertise to grow top-quality potatoes at home, they have ventured out to do it in other parts of the world.

## ***Market Power***

Growers are concerned about the increasing consolidation of buyers. It is true that buyers are getting larger and fewer, but the same thing is happening with growers. As grower numbers decrease, it becomes easier for them to organize. Some growers see the citrus cooperative, Sunkist, as the ideal they would like to work toward. Sunkist is an innovative global processing and marketing firm that is entirely owned by its grower members.

A group of Idaho growers formed United Potato Growers of Idaho in 2004 to gain market power in the fresh potato industry. Potato growers in other states formed similar regional co-ops and helped develop United Potato Growers of America. Development of the United Potato Growers of Canada soon followed. United succeeded in bringing higher, more stable prices to the fresh potato industry. An expensive lawsuit brought by a potato buyer led to a shift of United programs away from supply control and toward market information.

## ***Futures Markets***

Some commodity producers and buyers rely on futures markets to reduce price risk. This opportunity was available to potato growers in the past. The New York Mercantile Exchange, the Chicago Mercantile Exchange, and the New York Cotton Exchange provided potato futures trading, but dropped them due to low trading volume.

## ***New Products***

Thousands of new food products are introduced to U.S. consumers each year. They go through what is known as the product life cycle, which consists of four stages:

1. Introduction: The firm spends money to get people to try the product.
2. Growth: This can be quite rapid and profitable if the product is successful.
3. Maturation: When growth slows and product sales peak.
4. Decline: Sales decline, but innovative firms replace old products with new ones.

## **Fresh-Cut**

Some fresh-cut vegetable products are in stage 1 while others are in stage 2 of the product life cycle. Convenience has driven peeled carrots and bagged salads into stage 2, while fresh-cut potatoes lag behind in stage 1. There could be unmet demand for potatoes peeled and cut for consumers who want to eat fresh potatoes with little



**Fig. 18.13** Potandon Produce's branded, proprietary Klondike Rose<sup>®</sup> potato variety

preparation effort. The category could get a boost from the introduction of non-browning Innate<sup>®</sup> potatoes that can be packaged without preservatives.

Foodservice demand for fresh-cut potatoes also shows signs of growth. Some expanding restaurant chains, including Five Guys and In-N-Out Burger, feature generous portions of fresh-cut fries. While some foodservice buyers choose to buy raw product, others may develop a preference for peeled and cut refrigerated potatoes delivered to their doors.

### Branded Potato Varieties

The U.S. potato market includes both private and public varieties, such as the Russet Burbank. Most retail stores put fresh potatoes into four categories: russets, reds, whites, and other. Unlike apples, potatoes have not been marketed by variety. That is one reason that fresh potato consumption is declining, and fresh potatoes, in general, are in stage 4 of the product life cycle.

Developers of new varieties can apply for patent-like rights, called plant variety protection (PVP) that allows 20 years of exclusive property rights. During this period the developer can operate like a monopoly with that variety. After 20 years it becomes a public variety.

Since PVP is relatively new for U.S. potatoes, there is not a long history of marketing proprietary varieties. Some entrepreneurs, including Discovery Gardens with Sierra Gold<sup>®</sup> and Potandon Produce with Klondike Rose<sup>®</sup> (Fig. 18.13) have marketed their products at price premiums. Innovations like these could lead to changes in retail potato marketing that rewards branded varieties with higher prices. This would allow some fresh potato products to get out of stage 4 of the product life cycle.

## Sizing

Potato markets express size preferences through prices. In the fresh market, the highest prices are for count-carton size potatoes, followed by consumer-pack sizes. Potatoes too large or too small to fit into these categories are usually sold at lower prices to dehydrators or as low-priced fresh packs.

Size preferences have changed, especially for small potatoes, which facilitates moving some potatoes out of stage 4 and into stages 1 and 2 of the product life cycle. Fresh potatoes that formerly sold as low-priced Bs (USDA B-size), now often sell for prices higher than cartons. Even smaller C-sized potatoes, also known as Creamers, can bring the highest prices. In the frozen processing market, Simplot's Baby Bakers product line also offers price premiums for small potatoes.

Some potato packers have taken on small potato product lines to supplement their conventional packs. Others, such as The Little Potato Company, are specializing in small potatoes sold in attractive, small packages at high prices.

Size preferences reflected through prices can provide economic opportunities to growers. Those who can produce a smaller potato size profile through variety selection and cultural practices may find that producing small potatoes can provide big profits.

On the large end of the size profile, increasing demand for fresh-cut potatoes and fresh fries in QSRs helps support prices. Reduced peel loss is one attribute that can contribute to price strength for large tubers.

## Organic Potatoes

Since consumer demand for organic fruits and vegetables has been increasing, that market offers another way to put some potatoes into stage 2 of the product life cycle. Prices for organic potatoes throughout the marketing chain are higher than for conventional potatoes. Along with opportunities for higher prices, organic potato producers also face higher costs and higher risks.

The USDA allows use of the Certified Organic label for potatoes produced in fields where no prohibited materials (synthetic fertilizers and pesticides) have been applied for 36 months prior to harvest. This means that organic potato fields must go through 3 years of transition from conventional to organic. While those three crops cannot be sold as certified organic, growers must follow organic production practices. The transition period adds to the costs and risks of entering the organic potato market.

University of Idaho researchers conducted a survey of organic potato growers in Idaho and other states. Low yields, insect control, weed control, storage losses, labor shortages, and market risk were among the growers' concerns. Growers also mentioned a need for longer rotations. Some cited strong demand for organic rotation crops, especially alfalfa hay. Respondents also pointed out the need for developing marketing plans.





**Fig. 18.14** Organic potato packaging, which includes three brands: USDA Certified Organic, Grown in Idaho, and Wada Farms

A University of Idaho survey of 23 organic potato buyers revealed some market insights. All of the respondents said that they had experienced a shortage of organic potatoes. Tuber size preferences were for medium-sized potatoes. Preferences were for russet-type potatoes, followed by reds, then yellows, but some said there was also demand for fingerlings, purples, and other specialty organic potatoes. Packaging preferences were for 50-lb cartons, followed by 5-lb and 3-lb poly bags (Fig. 18.14).

## ***Biotechnology***

Potatoes were near the front of the development of food products made with genetically modified (GM) organisms. Calgene was first with the Flavr Savr tomato in the mid-1990s, but Monsanto followed shortly after with Newleaf® potatoes. Producers readily accepted the concept of potatoes that were genetically modified to protect themselves against pests. The problem was not with producer acceptance, but consumer acceptance.

As Monsanto was withdrawing from the biotech potato business, the J. R. Simplot Company began development of its biotech potatoes. Lessons learned from Monsanto's efforts led to Simplot doing three things differently.

First, Simplot focused on consumer traits rather than producer traits. Second, they used cisgenic rather than transgenic technology. Since many anti-biotech activists define GM as transferring genetic material across species lines, Simplot's Innate® potatoes, which only use potato genes, might be more readily accepted than Monsanto's Newleaf® potatoes. Third, Simplot implemented an identity preservation program in which only licensed growers and marketers can handle the product. This reduces the risk of Innate® potatoes getting into unwanted market channels.



**Fig. 18.15** Simplot Plant Sciences point of sale (POS) material for its White Russet® potatoes

Three federal government agencies—USDA, EPA, and FDA—approved Simplot’s Innate® Generation One potatoes for commercialization in 2015. One trait is a low level of acrylamide, a substance linked to cancer and birth defects in rats and common in foods cooked at high temperatures. Other traits include bruise resistance and non-browning when cut or peeled. In 2015 Simplot entered the fresh market with Innate® potatoes branded as White Russets™ (Fig. 18.15).

Innate® Generation Two has traits for late blight resistance and cold storage. Both generations will start in stage 1 of the product life cycle but could move rapidly into stage 2. These products could open the door for more new potato varieties that are better for producers, consumers, and the environment.