The Evolution of World Grain Trade

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Over the course of history, world grain trade has developed from the stage where grain was only shipped as incidental cargo to its status today, an industry in which thousands of tons of grain move daily. As a share of total consumption, traded grain has risen from less than 0.03% in the eighteenth century to more than 10% today. This explosion in trade volume has relied on communication and measurement technology, which has made information about grain available to buyers and sellers. As we enter the twenty-first century, the information component of demand for grain will continue to expand, thereby threatening to overwhelm the current infrastructure.

The grain trade has been plied across borders and oceans for more than 3,000 years. During that period of time, it has shifted significantly in character. Following the coast as they went, enterprising Bronze-Age merchants and their sailors loaded their flat-bottomed boats by hand with available commodities (including grains) and then sailed on to the next port to sell their wares. In the last decade, grain trade has become extremely specialized, involving transactions that are arranged through satellite communications. Said grain is then loaded onto huge, increasingly automated container ships in order to be delivered around the world.

Up until the last 200-300 years, internationally traded grain accounted for only a small fraction of grain consumption, and thus, grain trade did not require a separate trading infrastructure. Fernand Braudel estimated that traded grain accounted for only 0.03% of total grain consumption until the eighteenth century (Braudel). Today, imports make up more than 10% of grain consumption globally (USDA/WAOB). Some countries in Asia (i.e., Japan) are nearly totally dependent on grain imports other than rice. A reliable, rapid means of transacting for and acquiring grain on a global basis is essential to today's thriving international economy.

Grain trade has expanded rapidly over the last few centuries, thereby exponentially increasing the demand for information. The information content re-
quired by product buyers has evolved from knowing how much grain is required to feed restless Roman plebeians to distinguishing between grain types in the fifteenth and sixteenth centuries to issuing tenders for specific wheat classes beginning in the twentieth century. As we approach the next millennium, technological advances and sophisticated consumers could drive the market to focus on quality characteristics, as is already the case in a small but growing share of total transactions.

In this article, I will examine the course of evolution of the world grain trade and will discuss how these developments are reflected in the structure of the world economy and even in the language that is spoken. In addition to a historical overview, I will look at how these changes affect the relationship between buyers and sellers and at the context that this background creates for continued changes in the structure of the world grain market.

History of Agricultural Trade

The Phoenicians (living mostly in modern Lebanon) were the first world-class traders; they conducted a flourishing trade and established colonies in the Mediterranean during the second and first millennia B.C.E. Their access to trade routes came in part because of their development of keel-hulled boats (powered by both oar and sail). The Phoenicians were also the first maritime power to learn how to sail at night, using their knowledge of stellar positions. Archeological and limited documentary evidence suggests that their trade goods included raw and processed agricultural products, including timber, horses, grain, wine, olive oil, dye, metals (such as gold, copper, and tin), and ceramic and glass (Remler). Grain was not a priority trade item for them because of the space limitations on their ships. Often, grain was only loaded if more valuable cargo could not be found at a port (Casson).

The rise of city-states in Asia Minor and southern Europe and the concentration of the population within city walls led to increasing demand for grain grown outside the immediate area. Strong prevailing winds on the Mediterranean and Black Sea restricted trade to the few months in late summer when the weather allowed passage. The larger the state grew, the more reluctant the citizens were to depend on an irregular supply of grain.

Roman Grain-Trading Patterns

The inability of peasants, who often farmed on rocky or infertile Italian soil, to feed their urban population led, in part, to the expansion of Rome into neighboring regions. While demographic data from the antiquities are lacking, historians believe that by the age of Augustus (first century B.C.E.), as much as one-third of the population on the Italian peninsula was clustered in cities like Rome (Garnsey and Siller).

Beginning in the sixth century B.C.E., Rome was engaging in regular skirmishes with neighboring tribes in order to maintain control of the nearby Tiber Valley. Rome's domination of the Italian peninsula occurred over an eighty-year period, during which Romans alternately sought alliances and conquered territory; this period culminated in victory in the Fourth Samnite War in 243 B.C.E. The Romans cemented their position by establishing sixteen separate outlying colo-
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The accumulation of both land and slaves (a result of these conquests) allowed for the establishment of large estates. Crops grown on such estates were shipped to urban dealers for sale (Garnsey and Siller).

This same pattern applied for the next several centuries until, at its zenith, the Roman Empire stretched from Hadrian's Wall in northern Britain to Mesopotamia (modern Iraq). In some regions, the Romans' strategy of resettling citizens and former legions in overseas agrarian colonies failed because of the remoteness and/or inhospitable climates of these colonies. The Romans then resorted to assembling huge government-controlled estates, which were manned by hundreds of slaves who worked expressly to grow grain for shipment to Rome and to frontier military encampments.

Egypt was a major exporter of grain during this period; between the accession of Ptolemy the Great to the throne of the Pharaohs in 323 B.C.E. and the conquest of Egypt by Caesar Augustus in 30 B.C.E., the government's main source of revenue was derived from their control of the grain trade. The government maintained control by taxing the producers of surplus grain, which they held in state-owned silos in Alexandria and then shipped out on vessels from the island of Rhodes. Rome was a minor customer for much of this period, but by the end of it, the Roman navy conquered Egypt, in part as a means of denying others access to its grain (Casson).

During the Imperial era, the Roman navy patrolled the seas not to conquer new enemies but to protect the merchant fleet from pirates. The chief route it protected ran from Alexandria to Rome (or rather, to its nearby ports of Pozzuoli and Ostia); annually, over 150,000 tons of Egyptian grain, which accounted for one-third of Rome's consumption totals, traveled this route. The ships that moved the grain were built expressly to carry it, and they ranged in size up to 1,200 tons (Casson). The remainder of Rome's imported grain came from Sicily and North Africa. Most of the grain from these routes was not purchased by the government or by private dealers but rather constituted the taxes remitted to the central government by its provinces. Of the government-procured grain, much was initially sold to citizens at subsidized prices and was later distributed free of charge.

When Constantine I shifted the seat of power to Constantinople in A.D. 330, he diverted the flow of Egyptian grain away from Rome and toward his new capitol. After a series of attacks by barbarians during the fifth century A.D., the Western Empire disintegrated, and the need for an organized fleet that specialized in grain trade disappeared.

Medieval Grain Trading

Over the next several centuries, population pressures eased as waves of epidemics struck the European continent. Pirates and other marauding groups (such as the Vikings) emerged after the collapse of the Western Empire and were found cruising the seas and coastal waters around most of Europe. Maritime trade was hampered by the attacks that these groups launched on coastal villages and shipping lanes. The Crusades' increased demands on Mediterranean shipping capacity (required in order to move armies and equipment) also limited the ability of traders to move goods consistently on a commercial basis (Braudel).
The trading that did occur was conducted largely by those medieval city-states that operated small fleets. These fleets were privately owned and operated. In the north, trading lanes were dominated by the Hanseatic League, a loose confederation of seventy-five to one hundred semi-independent German towns. In the south, trade was handled by ships from the coastal Italian cities of Genoa and Venice. The holds of the Hanseatic ships carried grain from Germany, Russia, and Poland as well as iron ore, cattle, dried herring, and timber. These merchants traded wool and cloth with England via exclusive licenses granted by royal fiat, beginning with Edward II in the fourteenth century. The Italian ships carried products derived from more hospitable climates, including wine, fruit, olive oil, and grain (Morgan).

Although a variety of cereal crops (wheat, rye, and oats) were grown and shipped to grain-deficit countries, information about the quality of the grain received in a particular shipment was often lacking. In fact, the German word "korn" (the root for the English word "corn") referred to grain as an undifferentiated commodity. Among the documents of this era, most references were to "grain," although a few did refer to individual grain types in their discussion of trade (Dollinger). The main Baltic port of Danzig handled, on average, 1 million kilograms of grain annually during the fifteenth through the seventeenth centuries (Dollinger).

Part of the motivation for European countries to establish overseas colonies in Africa and the Americas during the sixteenth and seventeenth centuries was the need to fill the grain bins back at home. Shifting political alliances between countries made access to surplus eastern European grain uncertain for England, France, Spain, and Portugal, thereby driving these countries to look for alternative sources. Once colonies were established, both the laws of comparative advantage and customs regulations set by the mother countries dictated that trade flows consist of grain and other raw commodities, which were moving east to Europe (or north, in the case of African colonies), with finished products moving westward. The legal restrictions on colonies that were selling their goods gave merchants in the home countries monopsonistic power, thereby allowing them to keep offer prices for commodities, such as wheat, rice, tobacco, naval stores, spices, and dyes, static. For the first time, contracts were transacted for specific commodities, and producers made planting decisions based on the prices that European merchants were offering. Ultimately, the disparity in market power that the North American planters suffered was one of many factors contributing to the American Revolution in the 1770s.

The Industrialization of the Grain Trade
Industrialization in the nineteenth century can be traced to the establishment of commercial grain-trading firms. Coincidentally, this occurred during the same period that major grain-surplus areas in the Western Hemisphere, such as the United States, Argentina, and Brazil, gained independence (1776, 1816, and 1822, respectively). Russia, except during periods in which circumstances limited access to Baltic Sea ports (i.e., the Napoleonic Wars), continued as a major source of grain until the Russian Revolution in 1914 (Goodwin and Grennes). The emergence of a middle class in western Europe created demand for a steady supply
of bread-quality wheat, a supply that could not be met within the continent. Since these countries no longer possessed the political or military ability to compel former colonial regions to ship it, the grain had to be purchased at negotiated prices.

Once the protectionist Corn Laws in England were repealed in 1846, an infrastructure began to arise that would make this trade feasible. The London Corn Exchange, which had operated since 1749, formed the backbone of the emerging international trade. Over the next fifty years, several families began grain businesses that would one day dominate the world market. In Europe, the Fribourgs (Continental Grain), Louis-Dreyfus, Bunge, and Andre all emerged, while the Pillsburies, Peaveys, and Cargills began their milling and grain-handling operations in the United States (Morgan). The first effort to devise a uniform set of contracts began with the founding of the London Corn Trade Association in 1878 (Barty-King). These contracts included the provision of standard sample sets for grain of a certain origin. At the same time, railroad systems and steamship lines capable of moving the grain were developed in the United States and, to a lesser extent, in Argentina and Australia. By the end of the century, these countries established their own commodity exchanges in order to facilitate the movement of grain, and the modern grain-distribution system was born (Morgan).

Under this system, merchants no longer put grain on a ship without knowing what price it would receive upon delivery. Despite speculative activity and frequent attempts to manipulate the market, price discovery did occur in the commodity exchanges. As telegraphs and telephones developed, that price information was used as the basis for formulating contracts.

As the major grain trading companies established relationships with their counterparts in other countries, grain processors had some discretion about their source of grain. With a more reliable flow of product from the international distribution system processors began to view purchased grains as regular inputs in a production process. In the same way that grain had been divided into grain types in the seventeenth and eighteenth centuries, the grains were now increasingly differentiated. In the case of wheat, buyers early in this century expressed their preference for soft versus hard wheat based on the source country.

Much of the market power came to reside in those grain-trading firms that were much larger than either the crop producers or most of the processors, so early efforts to establish uniformity of contracts and the quality of the grain shipped met with failure. Traders were unwilling to surrender any ground. Consequently, most exporting countries took action in the first part of the twentieth century, enforcing a set of standards for the assessment of grain.

The Grain Standards Act of 1916 established the first grain grades and standards in the United States. Under this act, all grain and oilseed that is designated for export must be submitted for inspection and graded on the basis of a set of standard physical characteristics (Hill). The Canadian approach was to establish a state trading agency, the Canadian Wheat Board (CWB), whose antecedents date from the First World War. In its role as a marketer of all grain that is for export, the CWB also establishes quality criteria for grain that is accepted from farmers. Enforcement is conducted by restricting the grain varieties approved for delivery into export channels. Though its wheat board is of later vintage (1939), the Australian government follows an approach similar to that
adopted by Canada. All of these institutions disseminate information about the grain being transported, including (1) knowledge about the physical transfer of grain and the handling services involved; (2) the flow of information about the grain, including price and related factors (such as credit terms); and (3) descriptions of the physical and intrinsic characteristics of the grain contained in shipments.

The Interaction Between Grain Buyers and Sellers
In grain markets today, contracts negotiated between buyers and sellers reflect the conditions under which trade will be conducted in terms of both the physical and informational tracks. For the majority of transactions, the physical aspect of the grain trade dominates. The structure of these contracts allows buyers to substitute attributes that ensure the highest profitability. Automated technology of modern flour mills leads many wheat buyers to make their purchasing decisions based on the gluten content of the flour they intend to produce. This involves mixing and matching wheat of different classes in order to get the desired gluten content within narrow tolerances. Similarly, scientific advances in livestock management have given producers the ability to evaluate the metabolizable energy contained in the grain in order to create those feed rations best suited to their animals. The value of the grain is therefore based on its nutritive content. This constitutes a considerable shift in the concept of substitutability in marketing, which previously relied largely on the prices of grain relative to the most abundant grain (i.e., corn in livestock feeding or hard red winter wheat in the wheat market).

Organization of Grain and Oilseed Markets
Over the centuries, transactions in grain and oilseeds have occurred in several sets of markets, sets which sometimes overlap. Even today, the majority of deals are transacted in local and regional markets. Grain-deficit regions, which stem from dense population concentration and/or inadequate arable land, obtain supplies from other parts of the same country or from across international borders, depending on grain availability and transportation capacity within a given country. In terms of the importance of trade in use, the world rice market is the most thinly traded (at less than 5%), with the wheat market at the other end of the spectrum (with exports accounting for 19% of total consumption in 1996-97) (USDA 1998). Operating in parallel with these physical markets, information on grain characteristics and preferences flows between buyers and sellers as well.

Local and regional markets
Even in the complex world market we now face, a considerable amount of grain does not move far from the fields in which it was produced. For instance, in the United States, between 30% and 40% of corn produced is held back for on-farm feeding, seed use, or stocks, and about 10% of wheat (Heid, data updated from Leath, Meyer, and Hill). Of the grain marketed, 80% is typically delivered into the country elevator system and transported by truck over county roads. Because moving raw grain is relatively costly compared to the grain's implicit value,
processors and subterminal elevators tend to cluster within easy reach of major production areas. Ninety percent of the spring wheat milled or assembled for export in Minneapolis, MN, comes from within 450 miles of that city.

Within these regions, grain transactions are generally governed by a few key factors. The overall supply of grain generated by producers depends on the relative price incentives they detect at the time the fields are cultivated and the weather patterns that prevail in the region over the course of the growing season. How that grain is marketed depends on the accessibility to elevators and the extent of the farmer's own livestock operations and operations on neighboring farms. Local and regional demand for grain is determined by consumption requirements of the area's population (human and animal) and by existing relationships between producers, handlers, and processors.

When a processor in a grain-abundant region must meet tight requirements in order to produce a specific grain-based product, the buyer typically relies on informal relationships and past experience with the quality of grain received from various country elevators to locate a specific grain. In a few instances, the uniform quality of that raw grain is so crucial to the production process that the company finds it necessary to assure its supply by contracting with individual producers. These detailed contracts specify the varieties that producers must plant and restrict their cultivation practices. This level of control is exerted most often by food-processing companies, and it accounted for less than 2% of feed grain marketed and for less than 1% of food grain (chiefly wheat) marketed in the United States in 1993. Such production contracting is more prevalent in horticultural and livestock processing, reaching 99% in the sugar-beet sector and 85% for broilers in the same year (Manchester).

For the majority of grain moved from the farm to the elevator, prices are determined by the schedules posted on a daily basis at the local elevators and are adjusted by discounts or premiums assessed for quality factors that depart from the norm. Since elevators' ability to measure quality is limited to a few tests conducted as the grain is weighed and unloaded from trucks into storage bins, those discounts/premiums do not apply to a wide range of characteristics and during peak delivery time may not be applied at all. Posted prices are generally driven by the prevailing prices for the grain at the relevant cash exchanges. On average, 10% of grain and oilseeds delivered is priced in advance through futures-driven forward contracts (Manchester).

**National and international markets**

At this level, individual producers do not play a significant role. The supply side of transactions is in the hands of the national and multinational grain-trading firms and of the large-scale farmer-owned cooperatives who own the subterminal and terminal elevators. In some countries, such as Canada and Australia, the actual decisions are made by exporting state trading agencies, who hold the monopoly in purchasing authority (over domestic producers), although the physical transactions are often handled by private parties. On the demand side, trade is conducted by large-scale millers and processors who own the facilities and by private and state trading entities in importing countries.

In general, price formation occurs at the major grain exchanges, such as the
Chicago Board of Trade and the Minneapolis Grain Exchange. Pricing variations occur because of transportation costs, use of export subsidies and import tariffs, and variety and quality differences from the benchmark traded grain. While Argentine Trigo Pan wheat does not have the same quality characteristics as the hard red winter wheat traded in Chicago and Kansas City, the two wheats are nonetheless sufficient substitutes for most end-users such that a price change in one will affect the other.

Market for information

The flow of information occurs in parallel with the two markets described above, although the infrastructure for its dissemination is not as well developed as is the network of inland elevators and port facilities and rail, barge, and shipping lines that actually moves the product. While the physical trade has been going on for several millennia, the information flow has been important for less than a century.

Approximately 80% of world bulk grain transactions are based on a set of standard contracts established by the Grain and Feed Trade Association (GAFTA) in London, an association of grain traders, brokers, and processors in seventy-six countries that was founded in 1971. GAFTA combines the functions of the London Corn Trade Association and the London Cattle Feed Trade Association in order to promote international trade in grains, animal foodstuffs, pulses, and rice (Barty-King). GAFTA maintains and updates the language in contracts for more than 100 types of transactions, commodities, and countries of origin and it serves to arbitrate contract disputes.

Contracts for grain that is to be traded internationally typically require that execution of the contract include transmission of an inspection certificate, which is issued by an official agency of the exporting country. The certificate must assure buyers that grain loaded at the export facility meets or exceeds the contract quality requirements. These quality requirements represent those contained in the official grades and standards of the country. In addition, many contracts impose minimum or maximum limits on factors not covered under the official grade, such as moisture content or dockage (in the case of U.S. wheat) (Mercier 1993). In the past, these additional provisions have focused on physical grain attributes, because measurement of these attributes can be accomplished at relatively low cost during loading or unloading at elevators, while tests for intrinsic characteristics usually require expensive equipment and/or considerable time to process results.

Over the last several years, buyers have increasingly expressed interest in the intrinsic characteristics of the grain, because these factors are better than physical factors for predicting the grain's final performance. In most countries, such information is not included among the factors that make up official grades. However, the variety release regulations imposed in some countries (i.e., Canada and Australia) serve as a reasonable substitute. Under these rules, a grain variety is not released for public use unless it equals or exceeds the performance characteristics of the benchmark variety for its class (U.S. Congress). For buyers seeking grain in countries without such tight restrictions, they have recourse to buy on an identity-preserved basis, but that can add considerable cost to the transaction. The
grain-distribution systems in these countries are designed for efficient movement of standard-quality grain, which calls for bulk handling and blending of grains of different quality in order to meet contractual requirements. These features make it costly to segregate grain throughout the system, especially when the grain is destined for export. For example, shipping overseas by container rather than by bulk carrier in order to maintain the identity of a lot of high-quality grain can raise transportation costs by a factor of at least three to one (International Grain Council).

In most countries, official inspections are not required for grain moved within domestic channels, but nonetheless, buyers have ways of evaluating the quality of grain available for purchase. While some local jurisdictions offer grain testing at low cost, most processors and millers rely on their knowledge of past quality variations within their buying region and on long-standing relationships with local elevators to locate needed grain. In addition, the presence of in-house laboratories gives the buyers the ability to perform postdelivery testing and to dispose of grain in less discriminating outlets if it fails to meet their expectations. The transaction costs of such sifting of quality information are relatively low at the local level, because the need for segregation during handling is minimal. On the other hand, the costs to foreign buyers of acquiring and acting on such detailed information are prohibitively high in many cases, because use of segregation practices in international transactions of high-quality grain is essential for successful completion of such a contract. A handful of importers (such as the Taiwan Flour Milling Association) send agents on highly publicized tours of U.S. wheat-producing regions in order to identify the specific wheat to be purchased, but the volumes purchased as a result of such activities account for only a small share of total trade.

The central pricing mechanisms at the major grain exchanges (discussed above) reflect the trade for the bulk of the market (domestic and international), in which grain is differentiated only by class, grade, and protein content for some classes of wheat. In fact, for a grain like corn, which is largely destined for feed use, there is little differentiation by class in the composition of exports. Between 1986-91, nearly 70% of U.S. export corn was traded as U.S. number 3 or better, with only moisture maximums otherwise specified (Mercier 1994).

This elaborate set of mechanisms, combined with public dissemination of the resulting price data on a regular basis, has reduced the cost of arranging transactions for standard-quality grain but may have increased the cost of transactions for grain with quality attributes outside the standard set, especially for foreign buyers. Since such grain will not receive premium prices or segregated handling if sold into the general market, buyers and sellers must work within informal, secondary channels, in which pricing practices are less transparent. In a series of studies conducted by the Economic Research Service in the early 1990s, importing countries such as Japan, Taiwan, Korea, Italy, the Netherlands, Venezuela, Brazil, and the Philippines, were identified as exhibiting moderate to high sensitivity to the quality of their imported grains and oilseeds and were willing to seek such grains in some if not all transactions (Mercier 1993, 1994, 1995).

**Context for Continued Market Evolution**

Within the local-regional and national-international markets described above, the pressure on the informational infrastructure will increase. A number of fac-
tors will likely contribute to this pressure, such as the increasingly sophisticated tastes of higher income consumers and advances in processing technology. Responses from both the private and public sectors will be required in order to alleviate this pressure.

**Basis for Competition**

The broad competition between various exporters is largely price driven, although that motivating factor has lessened since the commitments of the Uruguay Round Agreement of GATT (UR Agreement). High world prices in the mid-1990s reduced the use of export subsidies, particularly in the world wheat market. The share of wheat sold under subsidies declined from 51% in 1991–92 to less than 16% in 1996–97. These subsidies helped exporters segment their markets, and for the 60–70% of eligible importing countries, the availability of discounted prices from some exporters greatly overshadowed the quality of the grain offered. On this macro, partly policy-driven level, the competition occurs between homogeneous commodities.

To some degree, such homogeneous competition also dominates the transactional level of the feed-grain market, as feed processors formulate the rations they will offer for sale based on the energy content of the grain available for purchase. However, even within the feed market, cultural preferences and livestock physiology constrain buyers' choices between grains. For example, consumers in Japan and Venezuela prefer brightly colored egg yolks, so feed processors who serve the layer industry buy more Argentine than U.S. corn, because their flint corn lends a brighter color to the eggs (Mercier 1994). The food and industrial-use market segment has demonstrated even more of a propensity to differentiate purchases, both in terms of quality and trade servicing attributes.

**Environment for Transactions**

The majority of grain and oilseed transactions occur within the local–regional market segment, with little reference to other segments except for price-discovery purposes. Information transmitted between them typically reflects relative prices and transportation and handling margins for standard commodities, (i.e., the benchmark product traded on the grain exchanges like U.S. number 2 yellow corn). Quality-sensitive buyers within local–regional markets can rely on informal channels to augment this information set, because the cost of diverting a shipment that does not meet their expectations is relatively low. Buyers with similar preferences in the international market absorb considerable costs in order to ensure the acceptability of their grain shipments, because being wrong would be very expensive.

Despite these costs, some buyers' requirements for high-quality grain cannot be met within their local–regional markets, which forces these buyers to search across market segments in order to locate adequate sources. In most years, these cross-market buyers are selected millers in Europe and East Asia, soybean food processors in Asia, and corn industrial processors in both regions. In years when wheat crops have lower-than-average protein, export elevator operators are forced to compete with inland wheat processors for good-quality hard wheats, which
increases price. These types of deals are characterized by the need for more detailed quality and handling information than is the norm.

Prospects for the Future

The demand for high-quality grain and oilseed is likely to increase over the next few decades, thereby straining the system's ability to transmit the necessary detailed information. This growth in demand stems from three factors: (1) increasing per capita income, especially in grain-deficient Asian countries; (2) the liberalization of grain trade, especially increased privatization of trading; and (3) the spread of more sophisticated milling, processing, and baking technologies.

While world economic growth is expected to increase at a 3.2% rate over the next decade, growth in Asia will be even stronger in the long term, at more than 6% a year (USDA 1996). Such growth will lead to a burgeoning middle class in these countries, a class that possesses increasingly sophisticated tastes in terms of food consumption. Especially in East Asia, minimal arable land in these countries will necessitate increased imports in order to supply these expanding consumption needs.

Trade liberalization in agriculture under the UR Agreement is expected to increase the volume of grain and oilseed traded worldwide by about 4% by the year 2005 (USDA 1994). In addition to multilateral liberalization, many countries have recently decided to dissolve or reform their state agricultural trading entities (STEs). While this may not increase the volume of trade, it should lead to a greater demand for quality grains and oilseeds, because private traders in the past have shown more responsiveness to quality preferences of end-users than have importing state trading agencies. STEs often place constraints on spending or policy objectives, with little concern for satisfying consumers.

In addition to its agricultural provisions, which will provide impetus for increased agricultural trade, the overall UR Agreement had separate accords that were designed to encourage trade in services and intellectual-property rights. These agreements have in part spurred an explosion in foreign direct investment (FDI) by multinational firms, particularly in food processing. Among U.S.-based firms alone, food processing FDI nearly tripled between 1984 and 1994, introducing state-of-the-art technology worldwide (Handy et al.). High-quality raw grains and oilseeds are likely to increase in demand as new western-style food products are introduced into foreign markets.

More detailed discussion of the current situation in the domestic and international grain markets and possible approaches to dealing with the overtaxed informational infrastructure can be found in the companion pieces to this article.

Endnotes

1 In 1906, a separate London Cattle Feed Trade Association was founded in order to cover trade in animal feeds and proteins.

2 The subsidized amount of wheat for 1991–92 includes wheat exported by Canada (because of their Western Grain Transportation subsidies, which ended in 1995), the United States, and the European Union (EU). In 1996–97, only the EU utilized export subsidies (Ackerman, Smith, and Suarez; USDA 1997).
References


