December 1997/AO-247

AGRICULTURAL OUTLOOK

Statistical Indicators

U.S. & Foreign Economic Data; Farm Prices; and Producer & Consumer Prices (tables 2 through 7). Other Statistical Indicators can be found in the printed version of the December 1997 issue of Agricultural Outlook. In the coming months, all Statistical Indicators will eventually be available in Adobe Acrobat.

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Cover: Cattle on range, Wyoming; Grant Heilman Photography

In This Issue . . .

World Beef Trade . . . the Changing Pork Industry . . . Meat Price Spreads . . . & Farm Real Estate Values

What Is Influencing World Beef Trade Patterns?

Increases in global incomes and a more liberalized trading environment have contributed to substantial growth in international beef trade over the past 15 years. Beef exports among the major traders are projected at 4.8 million tons in 1997, up 45 percent from 1980. Changing production, marketing, political conditions, and health and sanitary trade barriers have played an important role in the evolution of beef markets. These factors are likely to continue to exert a strong influence on meat production and trade patterns as meat trade continues to expand through the next decade. Global per capita consumption of beef is projected to increase through 2005 as meat demand rises in countries with rapidly industrializing and transition economies.

Interpreting Meat Industry Price Spreads

The farm-to-retail price spread for pork reached a record $1.62 per pound in October, attracting renewed attention to the difference between farm and retail meat prices. Current price spreads for Choice beef and broilers, although not at record levels, are also relatively high. Over time, nominal price spreads tend to widen as inflation increases the costs of marketing, processing, and retailing. Yet the most compelling feature of meat price spreads for Choice beef, pork, and broilers is that, when adjusted for inflation, they have remained fairly constant or even decreased slightly over the past three decades.

By examining price spreads and their components, the timeliness and completeness of price adjustments among marketing levels, as well as variations in marketing spreads, can be monitored over time. For beef and pork, the farm-to-retail spread has two main components: farm to wholesale and wholesale to retail. Deflated farm-to-retail spreads for both pork and Choice beef are driven by strong downward-trending *farm-to-wholesale spreads*, which more than offset changes in *wholesale-to-retail spreads* over the past three decades.

Value of Farm Real Estate Up Again in 1997

Agricultural real estate values in the U.S. continued to climb during 1996. USDA's estimate for the national average value of all agricultural real estate (land and buildings) as of January 1, 1997 is $942 per acre, up 5.8 percent from a year earlier—3.8 percent in inflation-adjusted terms. Several states showed double-digit growth. The increase in agricultural real estate values during 1996 marks the 10th consecutive year that values have risen since the national average bottomed out in 1987.

USDA's Economic Research Service (ERS) has been studying agricultural land values in order to determine the influences of agricultural and nonagricultural factors. Among the most influential agricultural factors are growing conditions and capital investments, including irrigation. Among nonfarm factors, the demand for farmland in urban and urbanizing areas is the predominant influence on farmland values. Not surprisingly, the relative influences of these and other factors vary among different regions of the country.

Cattle Cycle Unlikely to Turn Before 2000

The much-anticipated turn in the cattle cycle—when the nation's cattle herd will again begin to expand—appears unlikely to occur before 2000. For the second year in a row, disappointing pasture or range conditions and record-high hay prices led producers to retain fewer heifers for summer breeding than they had anticipated at the start of the year. Heifer slaughter for the first 9 months of 1997 was at a near-record pace. Although beef cow slaughter has been down since spring and is expected to decline even further over the next couple of years, without retention and breeding of larger numbers of heifers, beef cow numbers—and calf crops—will continue to decline at least through 1998, delaying expansion in the cattle herd until after the turn of the century.

Consumers May Benefit as Pork Industry Changes

How the hog industry is organized and how it does business ultimately affects consumers through prices and product selection. Production for the open market is being replaced by multi-year contracts and vertical integration (e.g., processors owning hog production facilities). These changing methods for transferring hogs from producers to packers can reduce packing costs and improve the quality of pork products for consumers.

Packers may reduce costs by obtaining a large, stable flow of hogs to minimize under- or overutilization of facilities, as well as by increasing control over the quality of hogs. Consumers stand to benefit through lower prices and/or an increased supply of higher quality pork products. ERS estimated potential benefits to consumers, in terms of leaner meat at lower costs, ranging from $60 to $693 million over one year, depending on the extent of change in industry organization and how much consumers were willing to pay for leaner products.

Briefs

Livestock, Dairy & Poultry

Cattle Cycle Unlikely to Turn Before 2000

The much-anticipated turn in the cattle cycle—when the nation's cattle herd will again begin to expand—appears unlikely to occur before 2000. The cattle cycle is caused by the biological time lag in beef production, coupled with producers' decisions to expand or liquidate their herds as economic forces dictate. During herd expansion, more heifers (young females that have never calved) are diverted from the feedlot to the breeding herd. This lowers cattle slaughter, which raises prices, leading producers to continue expanding their herds.

For the second year in a row, producers retained fewer numbers of heifers for summer breeding than indicated in USDA's January 1 cattle inventory report. In both years feed or forage conditions deteriorated, encouraging the marketing of heifers as feeder animals rather than retention for breeding.

Producers had indicated on January 1, 1997, that they were retaining 2 percent fewer beef heifers than the previous year as replacements for the late spring-early summer breeding season. However, in the July 1, 1997 inventory report, producers indicated a reduction of 4 percent in the number of heifers retained compared with a year earlier.

Although feed grain prices were well below a year earlier in the spring and summer of 1997, pasture and range conditions once again were disappointing, and hay prices were at record levels, reflecting very tight forage supplies and harsh winter conditions in the northern states. The October *Cattle on Feed* report found 21 percent more heifers were on feed than a year earlier. In addition, heifer slaughter for the first nine months of the year was at a near-record pace, second only to the prime herd liquidation years of the mid-1970's.

Beef cow slaughter remained near the high year-earlier level during the first quarter of 1997, as continued tight forage supplies led producers to cull less efficient cows. Since spring, however, beef cow slaughter has been down about 20 percent from a year earlier and is expected to decline even further over the next couple of years. But without retention and breeding of larger numbers of heifers, beef cow numbers—and calf crops—will continue to decline at least through 1998.

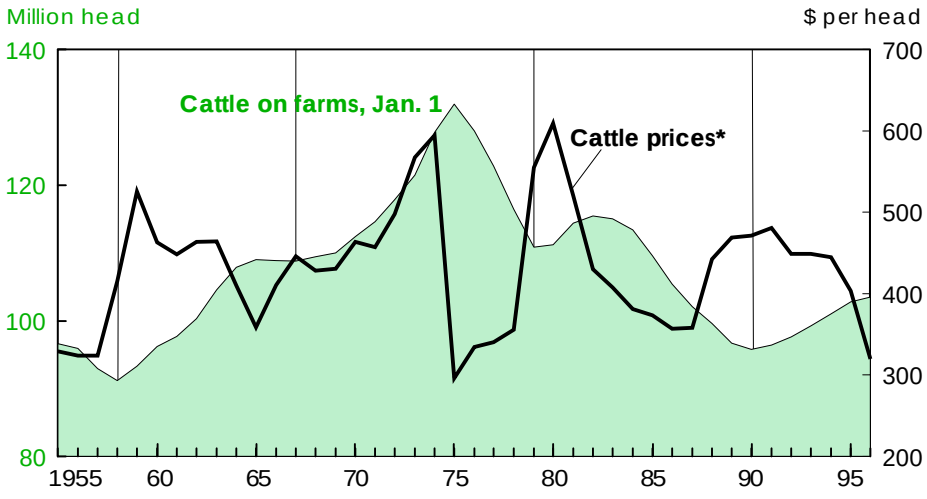
Supplies of feeder cattle outside feedlots and available for placements this fall and in 1998 are already beginning to tighten—supplies on October 1 were down 7 percent from a year earlier, and feedlot placements in October were down 4 percent from a year earlier. Feeder cattle supplies will continue to tighten over the next couple of years as the calf crops decline and as more heifers are retained for the breeding herd. Supplies will drop through at least 1999, and the decrease will halt then only if more heifers are retained for herd expansion this fall and bred next summer to calve in 1999. Tight feeder cattle supplies, combined with reduced cow slaughter, will hold beef production down until after the turn of the century.

The current cattle cycle began in 1991, the first year of expansion after a low point in 1990 of 95.8 million head of cattle and calves, down from the previous cycle's 1982 peak of 115.4 million head. The current cycle peaked in 1996 at 103.5 million head, the second consecutive cattle cycle to peak at a lower level than the previous cycle. The cattle and calf inventory was down to 101.2 million head in 1997 and is likely to continue to decline at least through early 1999.

Since the collection of cattle inventory data began in 1867, each successive cattle cycle peaked at a higher level through the 1968-79 cycle, when the cattle inventory peaked at an all-time record 132 million head. The decline from this peak began a period of adjustments to increase efficiency and remain competitive against the increasingly efficient pork and poultry sectors. The cattle sector experienced large income losses in the mid-1980's as a result of providing overfinished cattle, with more fat than desirable, leading to shifts toward a leaner consumer product. That trend, however, has likely moved toward an excess emphasis on lean beef, at odds with the current domestic and export markets, which are placing a premium on an increasingly tight supply of high-quality marbled beef.

The current cycle entered the liquidation phase in late 1995, which intensified in

The Cattle Cycle: Biological Time Lag Precludes Quick Reaction To Price Signals



Vertical lines indicate low points in the cattle cycles.
*1982-84 dollars.

Economic Research Service, USDA

The Cattle Cycle: Biology as Destiny?

The cattle cycle is a 7-to-10-year period encompassing the expansion and subsequent contraction of the country's beef cattle herd. A new cycle starts when the herd begins expanding again. Livestock producers' ability to expand or contract in response to market signals is circumscribed by a biological factor—the length of time required to produce new animals for the market.

The biological component of the *poultry cycle* is by far the shortest livestock cycle, requiring only about 7 months from the time an egg is fertilized and laid, the chick is old enough for breeding, and her offspring reach slaughter weight. Moreover, chicks retained for the breeding flock comprise only a minuscule proportion of the production potential; most chicks will be sold for food before reaching breeding age. As a result of this short biological cycle and the small ratio of breeding animals to slaughter animals, poultry producers can adjust very rapidly to market conditions.

The biological *hog cycle* is somewhat longer than for poultry, about 20 months from the time a sow is bred and farrows, a retained gilt reaches breeding age, and her offspring reach slaughter weight. Unlike poultry, each gilt retained for breeding has some impact in slowing pork production gains during the 12-18 months before her first offspring are sold. But that impact is steadily decreasing, with litter size approaching nine pigs and most sows farrowing at least twice a year, allowing pork producers considerable ability to respond to market opportunities.

The biological *cattle cycle* is considerably longer than either the poultry or hog cycle. Fifty months can pass from the breeding of a beef cow; the birth of her calf and its growth to breeding age; and the birth of that calf's offspring, its weaning, time in grazing and a feedlot, and finally, slaughtering.

Given this long biological cycle, cattle producers must make decisions for future production nearly 4 years ahead, limiting their ability to adjust quickly to market changes. Moreover, each heifer calf retained for the breeding herd has an almost one-to-one bearing on reducing beef production in the 4 years it takes for expansion, since cows generally produce a single offspring annually. Thus, the cattle cycle lasts from 7 to 10 years, as decisions on whether to breed more cattle or to slaughter cows and heifers for beef production are impacted not only by such factors as meat and feed prices and forage conditions, but by the single births and the long biological component of the cycle.

1996 as grain prices set new records. Corn prices rose to well over $4 per bushel in late-spring to early-summer 1996. Conditions for cow-calf producers were exacerbated by a severe drought that spread from the Southwest in late spring into the Central Plains, the heart of the cattle-raising sector, by mid-summer. Drought sharply reduced grazing prospects and led to higher hay prices, forcing cattlemen to cull their herds severely and retain fewer stocker cattle—those kept for additional grazing before being placed in feedlots. Reduced forage also lowered demand for stocker cattle that are purchased for pasture gain.

At the same time, rapidly rising grain prices reduced the break-even price that feedlot owners could pay for cattle to be placed on feed. The value of feeder cattle weighing 750 to 800 pounds declined from a range of $67-$74 per cwt in first-half 1995 to $55-$59 in first-half 1996. Even as feeder cattle prices plummeted, feedlot owners reduced placements sharply in first-half 1996 to under 7.6 million head, down 14 percent from a year earlier.

The end result was a year of large losses for feeder cattle producers, leading to liquidation of the beef cow herd and dramatic reduction in heifer retention. Cow slaughter rose from 6.3 million head in 1995 to 7.3 million in 1996. As a result, beef production rose to 25.5 billion pounds, second only to the 25.7 billion pounds produced in 1976, when the cattle inventory was 132 million head (compared with 1996's 103.5 million) and the industry was experiencing the largest liquidation in history.

Beef production in 1997 is projected to be down slightly from 1996 levels. Production in 1998 is expected to decline about 2 percent, but declines in the second half of the year are likely to be even greater if forage supplies and grain prices become more favorable, encouraging retention of cows and heifers. Although these downward shifts in beef supplies are raising cattle and retail beef prices, large and expanding supplies of competing meats will limit price increases.

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December Releases—USDA's Agricultural Statistics Board

The following reports are issued electronically at 3 p.m. (ET) unless otherwise indicated.

December

1	*Crop Progress (after 4 pm)*
3	*Broiler Hatchery* *Egg Products* *Poultry Slaughter*
4	*Dairy Products*
5	*Cheddar Cheese Prices (8:30 am)*
10	*Broiler Hatchery*
11	*Cotton Ginnings (8:30 am)* *Crop Production (8:30 am)*
12	*Cheddar Cheese Prices (8:30 am)*
15	*Milk Production* *Turkey Hatchery*
16	*Potato Stocks*
17	*Broiler Hatchery*
18	*Agricultural Chemicals—Restricted Use Summary*
19	*Cattle on Feed* *Chickens & Eggs* *Cold Storage* *Cheddar Cheese Prices (8:30 am)*
23	*Cotton Ginnings (8:30 am)* *Catfish Processing*
24	*Broiler Hatchery* *Livestock Slaughter*
26	*Cheddar Cheese Prices (8:30 am)*
29	*Hogs & Pigs* *Peanut Stocks & Processing*
30	*Agricultural Prices*
31	*Broiler Hatchery*

Briefs

Specialty Crops

Wood & Paper Products Lead Industrial Use of Ag Materials

The value of agricultural products used as raw materials in the manufacture of industrial products (nonfood, nonfeed) has surpassed $100 billion. In 1992, the most recent year for which data are available, the value amounted to an estimated $110 billion. All major industry groups used agriculturally derived materials in 1992.

Wood and paper accounted for more than 87 percent of the total. The second-largest category of agricultural materials used as industrial inputs in 1992—other fibrous materials—reached a total value of nearly $7 billion. Raw cotton use accounted for an estimated $3.1 billion of this total. Other cotton products, including cotton yarns, fabrics, felt, linters, and waste, added another $3.3 billion. Industry also used $370 million worth of raw wool and wool materials in 1992.

Animal products, the third-largest category of agricultural material used by industry, totaled nearly $3.5 billion. The leather and leather products industries purchased $1.2 billion of hides, skins, and pelts, while the leather products and apparel industries used another $1.5 billion of finished leather. Nearly $600 million worth of animal fats, oils, greases, and tallow went into the production of perfumes, cosmetics, and chemical preparations. Manufacturers of medicinal chemicals and pharmaceutical preparations purchased $51 million of pharmaceutical-grade gelatin. Finally, $16 million of dressed hair, including horse hair, was used to make brooms and brushes.

Industry also used $69 billion of raw materials that are partially derived from agricultural sources—intermediate goods both from agricultural and petroleum sources. Materials in this category include, for example, "knit fabrics," which may be made of synthetic fabrics like polyester as well as of natural fabrics like wool.

An additional estimated $5.5 billion of raw materials now derived from petroleum sources may in the future come from agricultural and forestry products. This estimate offers researchers working on new industrial uses for agricultural materials a rough indication of potential market size for industry inputs.

USDA and other researchers are actively exploring new processes and procedures to expand industrial uses of agricultural materials. For example, a new technology, not yet employed commercially, can turn cornstarch into propylene glycol, glycerine, and ethylene glycol, with uses as varied as soap and personal care products, and antifreeze. Researchers are also refining the use of soybean and other vegetable oils in letterpress and lithographic printing inks. For each new use, however, agriculturally derived materials will have to compete with more well-established, petroleum-based counterparts.

The paper and allied products industry was the largest major industry user of agricultural raw materials in 1992, spending nearly $39 billion on agricultural inputs and $2.5 billion on intermediate

Deriving the Value of Agricultural Materials Used by Industry

In an attempt to produce a comprehensive estimate of industrial uses of agricultural materials, researchers at USDA's Economic Research Service (ERS) have focused on data from the 1992 Census of Manufactures, one of a series of surveys conducted by the U.S. Bureau of the Census at 5-year intervals. The Census of Manufactures uses a material code to report on materials used in production by firms in various industries. With the help of chemists and chemical engineers, ERS analysts developed a list of material codes that classify inputs as agriculturally derived, partially agriculturally derived, or potentially derived from agriculture.

The *agriculturally derived* category includes materials obtained from agricultural, forestry, or natural-plant sources. These materials have received various amounts of processing, from goods with little processing, like raw cotton, to finished products used as intermediate goods in the manufacture of other products, such as vegetable oils.

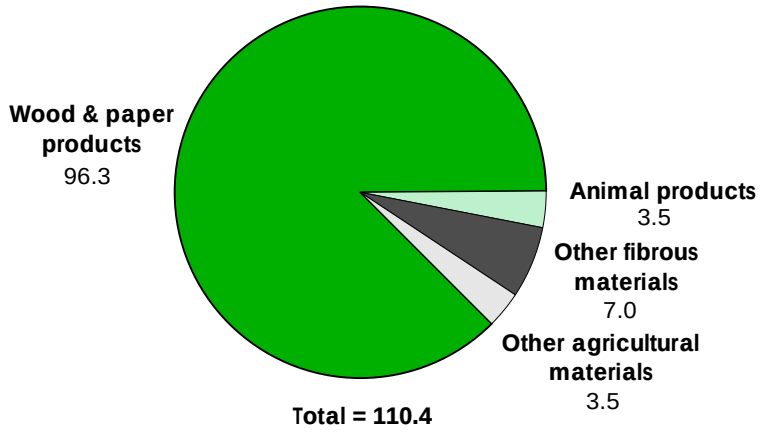
The *partially agriculturally derived* category includes three types of materials or chemicals: those that are partially derived from agricultural sources, those that are agriculturally based but are included by the Census in an aggregated group containing both agriculturally based and nonagriculturally based materials, and those that can be derived from either agricultural or petroleum sources for which information on the derivation is not provided by the Census. The category of materials *potentially derived from agriculture* includes those that may in the future be made of agricultural or forestry products, but are presently obtained from petroleum sources.

The use of Census of Manufactures material codes as a basis for estimating the value of agricultural materials used by industry has some limitations. When the use of agricultural materials in the production processes of particular industries is minor or not well known, or when the value of agricultural materials used is low, the Census is unlikely to capture information about the use of those inputs. As a result, the use of agricultural materials as industrial inputs may be underestimated. Underestimates may also result from the withholding of some data by the Census—for example, to avoid disclosing information about individual companies.

Use of these data may also result in some overestimation of the value of agricultural materials used by industry, primarily from double counting. For example, the value of cotton as an input is counted twice, once as an input into the manufacture of an intermediate good—yarn—and again as an input (in the form of yarn) in the manufacture of fabric.

Briefs

Wood and Paper Products Far Surpass the Value of Other Agricultural Materials Used in Manufacturing



$ billion

Economic Research Service, USDA

goods partially derived from agricultural sources. The lumber and wood products industry was second, using $23 billion of agriculturally derived and $0.6 billion of partially agriculturally derived materials. The chemicals and allied products industry ranked as the third-largest industry group, spending $5.5 billion on agriculturally derived materials and $16 billion on partially derived intermediate goods.

The importance of agricultural materials as inputs varied among industries. Nonfood manufacturing industries spent nearly $180 billion on agriculturally derived and partially agriculturally derived materials in 1992, nearly 8 percent of the total $2.3 trillion spent by industry on raw material inputs for production.

Agricultural raw materials were most important to the leather and leather products industry, accounting for 38 percent of all inputs. Agricultural raw materials were also important to the paper and allied products and apparel industries, accounting for 32 and 31 percent of their inputs, although for the apparel industry, most of the inputs came from partially derived agricultural materials.

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Upcoming Reports—USDA's Economic Research Service

The following reports will be issued electronically on dates and at times (ET) indicated.

December

2 *Agricultural Exports**
12 *Cotton & Wool Outlook (4 pm)***
*Feed Outlook (4 pm)***
*Oil Crops Outlook (4 pm)***
*Rice Outlook (4 pm)***
*Wheat Outlook (4 pm)***
16 *Tobacco Yearbook**
17 *Rice Yearbook**
Livestock, Dairy & Poultry (12 noon)
18 *Sugar & Sweeteners Yearbook**
*Europe**
22 *U.S. Agricultural Trade Update (3pm)*
23 *Agricultural Income & Finance**

January

14 *Feed Outlook (4 pm)***
*Oil Crops Outlook (4 pm)***
*Rice Outlook (4 pm)***
*Wheat Outlook (4 pm)***
16 *Livestock, Dairy, & Poultry (12 noon)*
21 *Agricultural Outlook**
23 *U.S. Agricultural Trade Update (3pm)*

*Release of summary, 3 p.m.
**Available electronically only

The next issue of *Agricultural Outlook* will be published in February 1998.

The staff of *Agricultural Outlook* extends best wishes to our readers for the holiday season and the new year.

Commodity Spotlight

U.S. Meat Export Federation

World Beef & Cattle Trade: Evolving & Expanding

Increases in global incomes in a number of key regions and the advent of a more liberalized trading environment have contributed to substantial growth in international beef trade over the past 15 years. Beef exports among the major traders are projected at 4.8 million tons in 1997, up 45 percent from 1980. But certain trade barriers—sanitary, quality, technological, and cultural—combined with changing production, marketing, and political conditions have also played an important role in the evolution of beef markets. These will likely continue to exert a strong influence as meat trade expands through the next decade.

Beef is produced and consumed worldwide, yet large-scale beef trade is limited to a relatively small number of countries and represents a small but growing proportion of total consumption. Among major producing and consuming countries, exports of beef represent about 11 percent of production, compared with 7 percent in 1980.

Health and sanitary regulations predicated on fear of spreading virulent cattle diseases such as brucellosis and foot-and-mouth disease (FMD) have limited the marketing opportunities of surplus beef producing regions. Such regulations have effectively segmented international trade in beef into two distinct markets. Many countries will not accept live animals or fresh, chilled, or frozen meat from regions where cattle diseases are endemic.

Trade in *live cattle* is significantly smaller than beef trade (both in terms of value and volume), at less than 1 percent of cattle inventories. Trade in cattle tends to be limited to countries that are geographically close, due to potential risks in shipping live animals. Examples include intra-NAFTA trade, intra-EU (European Union) trade, and Australia-Southeast Asia cattle trade. However, some breeding animals may be traded long distances when the animals' value outweighs the higher transport costs.

Cattle production worldwide is differentiated by animal genetics and feeding methods, resulting in differing quality types. Cattle are basically residual claimants to crop or land resources. Those countries with excess or low-value land tend to grass-feed their cattle herds, while those countries with excess feed grains, such as the U.S. and Canada, finish cattle with a grain ration. Grain-fed cattle have more internal fat (i.e., marbling) which results in a more tender meat than forage-fed cattle of a similar age. In Japan, although not a grain surplus country, tastes and preferences have encouraged feeding grain to cattle, but at a high cost since the grain must be imported.

In much of the world, cattle are producers of both milk and meat. Dairy cattle or dual-purpose animals tend to be less efficient at producing beef. Government policies (such as in the EU), however, may encourage beef production as an offshoot of support for dairy production.

Differences in the type or quality of beef produced can influence a country's trading patterns. For instance, the U.S. is a major *exporter* of *grain-fed beef* but a large *importer* of *grass-fed beef* for the processing industry, primarily for hamburger.

In addition to quality differences, changes in shipping technology and meat processing have influenced production and patterns in meat trade. Changes in technology such as modified-atmosphere packaging (i.e., vacuum packaging using inert gases), containerized shipping, and refrigerated containers have increased shelf life, permitting fresh product to be shipped a greater distance.

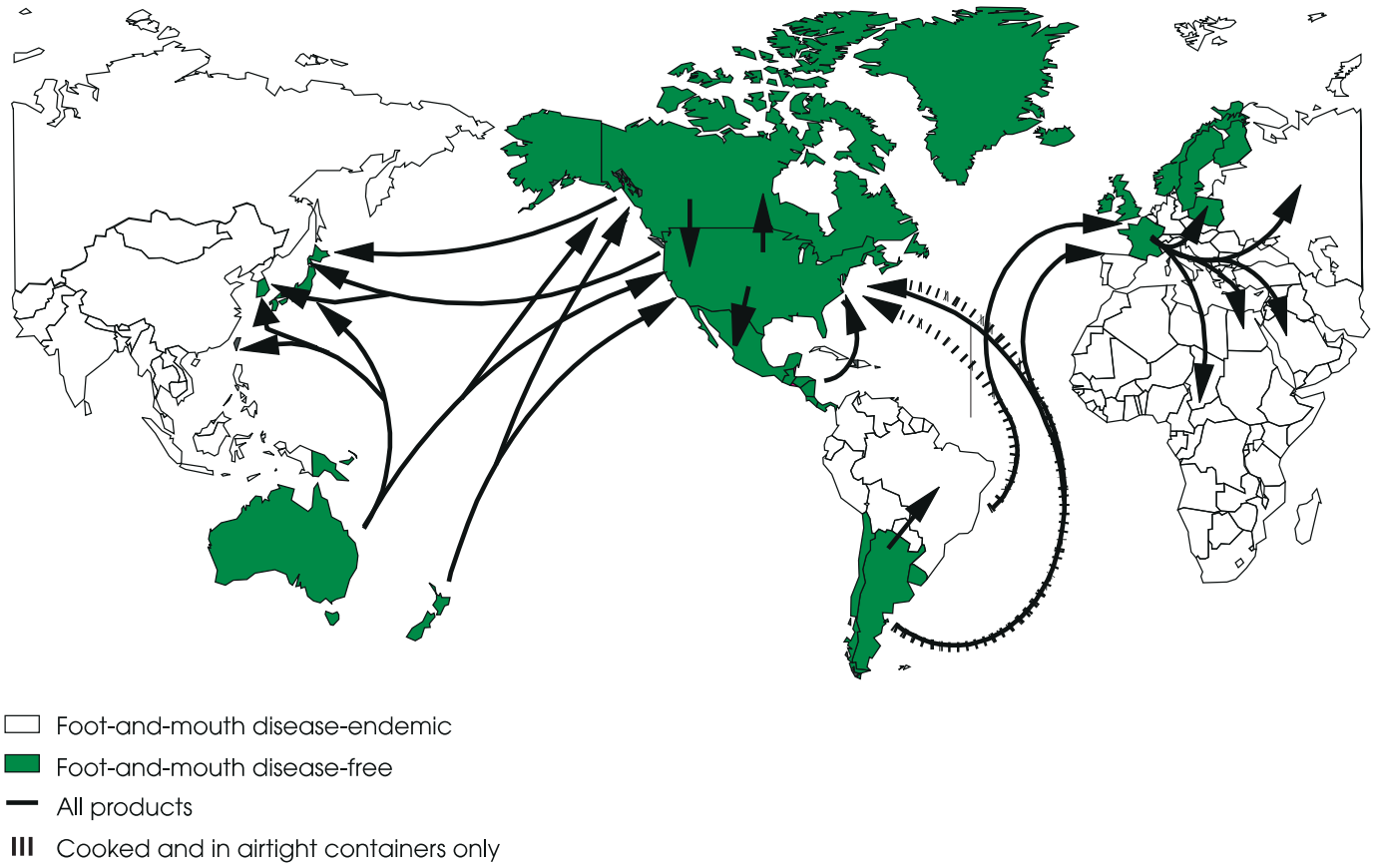
Cultural differences are also a factor in determining beef flows. Although there is only one major country where religious belief limits the consumption of beef, other factors such as cooking techniques (braising vs. stir frying vs. roasting), consumer perceptions of healthfulness, and preferences in color or size of cuts may determine sales in certain markets. The move to marketing meat cuts has allowed exporters to target specific markets with the products that match consumer preferences. Examples include high-value table cuts destined for Japan, low-value cuts for sausage to Russia, and a mixture of cuts for Mexican consumers. Those exporters who alter cutting characteristics, or otherwise address consumer needs, have a better chance of increasing sales.

Beef Production Rising, Consumption Grows Steadily

Beef production in the major producing countries is projected to reach 48 million tons in 1998. Production has increased 20 percent from 1980 to 1996 and is expected to continue increasing at about 1.5 percent per year through 2005. (The Food and Agricultural Organization of the U.N. provides a more comprehensive set of production numbers than USDA's Foreign Agricultural Service. According to the FAO, world beef production increased 18 percent between 1980 and 1996 and is estimated at 55 million tons in 1997.)

Beef production tends to be concentrated, with the top six producers—the U.S., the EU, Brazil, China, Argentina, and Russia—accounting for about 60 percent of global production. Significant shifts among producers have occurred over time. Due to economic restructuring in *Russia*, production declined precipitously, falling 45 percent or nearly 2 million tons since 1990. Production in *China*, in contrast, has increased dramatically. Over the next

Most Beef Trade Orginates from Only a Few Countries



Disease status as determined by USDA's Animal and Plant Health Inspection Service.

Economic Research Service, USDA

10 years China is expected to have the world's fastest rate of production growth as booming internal demand for beef, driven by strong income growth and rapid urbanization, encourages expansion. Increased demand in Russia and *Brazil* is also expected to help stimulate their domestic production.

The *U.S.*—largest of the world's beef producers—is in the contractionary phase of its cattle cycle. Production peaked in 1996 at 25.5 billion pounds, and is expected to remain below that level through 2005 as cattle inventories contract over the next 2 years. U.S. beef production is expected to begin to increase after 2000. *Argentina* has suffered from declining production as government policies encouraged a shift in resources to the grain sector. However, the recent declaration of Argentina as free of FMD could encourage increased production to service international markets.

The *EU* has suffered from periodic market imbalances, particularly oversupply, since the mid-1980's. Prior to 1992, dairy policies kept production relatively constant, and large stocks were depleted through increased export activity. However, reform of the Common Agricultural Policy (CAP) in the early 1990's began reducing dairy cattle and beef production. Additional pressure has resulted from the bovine spongiform encephalopathy (BSE) crisis (*AO* June 1996) and by GATT-mandated reductions in export subsidies. The BSE crisis, which came to a head in 1995-96, reduced domestic consumption and caused a sharp drop in exports. As stocks continue to accumulate and consumption remains weak, it is likely that production in the EU will have to fall further over the next 10 years.

Global per capita consumption of beef is projected to increase through 2005 as meat demand in countries with rapidly industrializing or transition economies increases with income growth. Gains in per capita consumption are expected in most Asian countries. In China, South Korea, and Japan, the rise in consumption should outpace population growth, while consumption in other countries in the region should be about even with population growth.

Some growth is expected in Latin America, but gains in per capita

consumption due to income increases in Mexico and Brazil will be largely offset by declines in Argentina's per capita beef consumption. While Argentina has one of the world's highest per capita beef consumption rates, consumption is highest among the lower classes, which have seen a decline in purchasing power in recent years.

Per capita beef consumption is expected to increase in a number of Central and Eastern European countries after years of decline, but countries that have delayed liberalizing their economies—e.g., Belarus and Uzbekistan—face a longer period of decline before income growth stimulates beef demand. In Russia, beef consumption has fallen since 1985, due to economic restructuring and loss of purchasing power. As the Russian economy recovers, beef demand is expected to increase gradually, but because of the availability of relatively cheaper pork and poultry, demand for those meats is expected to increase more rapidly.

Per capita beef consumption in the U.S. is expected to fall over the next 3 years as production declines, and as relative prices favor consumption of other meats. EU beef consumption has recovered slightly from the impact of the BSE crisis, but EU demand for beef will likely remain weak for at least the next 5 years. Any additional discoveries of BSE or any further incidences of beef-related human illness could further reduce demand and set back the recovery in consumption.

Market Liberalization Boosts Trade

The world's five largest importers—the U.S., Japan, Russia, the EU, and Canada—account for about 70-75 percent of global imports. Market liberalization has begun to increase demand for imported beef in a number of Pacific Rim countries. Although currently small importers, South Korea, Taiwan, and Mexico are expected to see substantial growth. These countries tend to demand grain-fed beef, which would benefit the beef industries in the U.S., Canada, and potentially Argentina.

The *U.S.* is the world's largest importer of beef, with projected imports of nearly 1.1 million tons (carcass weight) in 1997 and 1.2 million in 1998. In general, imported beef competes with U.S. cull dairy and beef cows in the production of hamburger. Imports have averaged 9-10 percent of U.S. consumption since the mid-1980's, but the actual level depends on the phase of the U.S. cattle cycle. During the liquidation phase of the cycle, U.S. slaughter of cows from breeding herds increases and imports of beef decline.

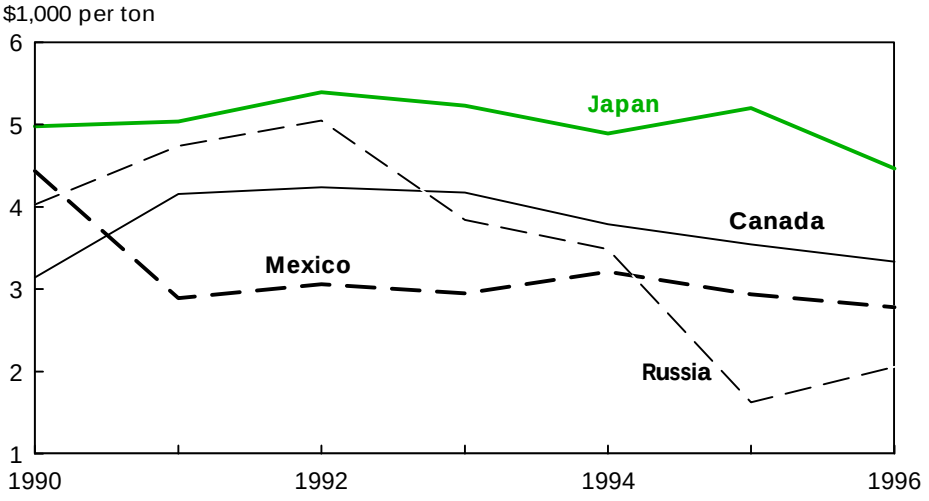
Most U.S. imported beef comes from Canada, Australia, and New Zealand—all FMD-free countries. The U.S. restricts imports from FMD-endemic regions to cooked product. The U.S. is likely to see increased levels of imports after 2000 as the U.S. enters a cattle rebuilding phase and retains female stock (heifers and cows) for breeding. The U.S. is expected to remain the largest importer of beef through the middle of the next decade.

Japan trails only the U.S. in beef import volume with projected 1998 imports of 914,000 tons, and the gap has narrowed considerably since Japan began liberalizing its market in the mid-1980's. However, Japan is the world's leading beef importer in value terms due to imports of high-valued cuts. Japan's import volume climbed 317 percent between 1985 and 1996, and is expected to increase 4 percent per year through 2005. Japan is committed to reducing its beef tariffs in accordance with World Trade Organization (WTO) commitments, and imports are projected to increase from 60 to almost 70 percent of consumption by 2000 as a result.

Australia and the U.S. are the major suppliers of beef to Japan and are likely to remain so for the foreseeable future. The U.S. provides the vast majority of Japan's grain-fed beef imports, while Australia supplies grass-fed and some short-fed beef. Short-feeding, done to add some marbling, involves grain feeding for less than 90 days, in contrast to 140-150 days of grain feeding in the U.S. Argentina could ship beef to Japan under its new FMD-free status, but is not expected to challenge either the U.S. or Australia for dominance.

Russia has been a substantial importer of beef, a fact which was obscured by the large amount of internal trade in the Soviet Union. However, imports fell dramatically following the breakup of the Soviet Union. Declines in consumer incomes and the economic restructuring of the livestock sector, including the loss of production subsidies, has led to a sharp decline in beef production, down 65 percent since the late 1980's. As government

Japan Imports Higher Valued Cuts of U.S. Beef



Annual average U.S. export unit values for beef and veal.
Source: U.S. Bureau of the Census.

Economic Research Service, USDA

support for consumption was eliminated, per capita consumption declined to levels more in keeping with countries at a similar economic level. Imports of low-value beef from other former Soviet republics, other European countries, and the U.S. have risen as production fell.

In the next decade, Russia's beef production is expected to begin increasing and will likely offset some imports. However, by the middle of the decade, imports could rise again as demand growth due to income gains outstrips beef production growth.

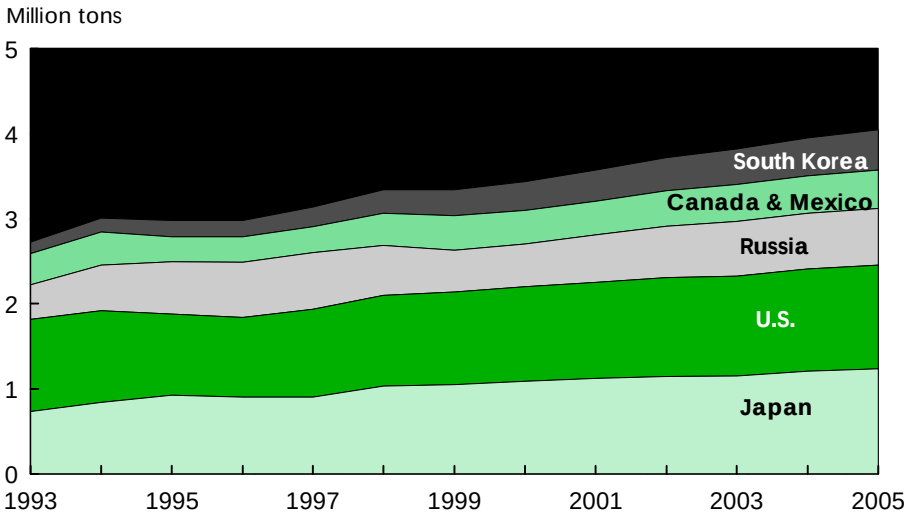
The *EU* currently ranks as the world's third-largest exporter and fourth-largest importer (excluding intra-EU trade). EU policy had been geared to maintaining market balances by exporting beef under subsidies and limiting imports. Imports have traditionally been supplied by the U.S., Argentina, and Brazil. However, the U.S. has been excluded from shipping product to the EU since 1989 because of the EU's ban on beef produced with growth-promoting agents such as anabolics. A recent WTO panel has overturned the ban, but the EU plans to appeal the ruling and will likely continue to try to prevent U.S. beef from entering.

Over the past several years, EU beef imports have been dampened by large internal stocks of beef as well as by consumer concerns over the safety of beef consumption in reaction to the BSE outbreaks in Europe. Given large domestic beef supplies, it is highly unlikely that EU government will favor expanding imports beyond its WTO commitments. It is also unlikely that these large stocks can be marketed without use of export subsidies or a substantial decline in the domestic market price to near world levels. Unless the EU violates its WTO commitments to limit the use of export subsidies, it is left with the unpalatable choice of either reducing production or carrying larger stocks.

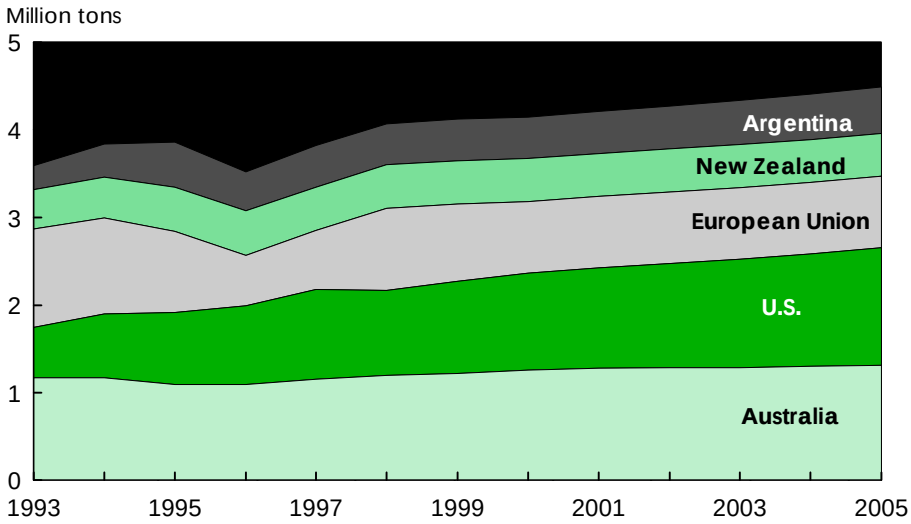
Like the U.S., *Canada* imports fresh, chilled, and frozen beef only from FMD-free countries and limits imports through a tariff-rate quota (TRQ). However, the U.S. and Mexico are exempt from TRQ's under the terms of the U.S.-Canada Free Trade Agreement and its successor, the North American Free Trade Agreement (NAFTA). Under the terms of these two agreements, each nation exempted the other from any quantitative limits, and under the accelerated schedule of tariff reductions there are no tariffs remaining among the three countries. Consequently, the U.S. has become Canada's primary source of imported beef.

Canada is in the liquidation phase of its cattle cycle. Imports are projected to decline over the next several years as large amounts of domestic beef compete with imported product, but will then increase as the next inventory buildup begins. The U.S. has traditionally shipped higher value, grain-fed beef to the population centers of eastern Canada. But there has been an expansion of slaughter capacity in western Canada by U.S. firms

U.S. and Japan Are the Leading Beef* Importers . . .



. . . While U.S. and Australia Are the Leading Exporters



1997 preliminary; 1998-2005 projected.
*Includes veal.
Economic Research Service, USDA

Commodity Spotlight

which are beginning to market more product in the East. This recent expansion, coupled with the potential for growth in domestic cattle feeding due to changes in Canadian grain policies, could place U.S. exports to Canada under increased competition.

The world's five largest exporters—Australia, the U.S., the EU, New Zealand, and Argentina—account for about 75-80 percent of world beef trade. However, since the mid-1980's a number of shifts have occurred among major traders. Brazil, for example, the third-largest beef exporter in the mid-1980's, has fallen to sixth due to several factors such as increasing domestic demand absorbing a larger share of internal supplies, government policy that continues to discourage meat production, and Brazil's inability to achieve FMD-free status. On the other hand, the U.S. has seen its share of world beef exports expand sharply over the past 15 years.

U.S. beef exports have grown from less than 1 percent of production in 1980 to almost 8 percent in 1997, lifting the U.S. from eighth-largest exporter to second. U.S. beef exports are projected up 2 percent at 870,000 tons in 1997 and another 9 percent in 1998 at 950,000. The majority of the long-term growth in U.S. exports can be tied to trade liberalizing agreements. Well-positioned as a producer of disease-free, well-marbled beef, the U.S. has been able to capitalize on market liberalization in the 1980's and 1990's.

The Japan-U.S. Beef Citrus Agreement of 1988, and both the U.S.-Canada and North American Free Trade Agreements, have helped to open substantial new marketing opportunities for U.S. beef exports. Trade with these three countries—Canada, Mexico, and Japan— represented 80 percent of U.S. beef exports in 1996. These trade gains, coupled with an expanding market in Korea, are expected to continue boosting U.S. exports through 2005 to about 12 percent of production. The U.S. will likely become a net beef exporter (volume terms) by the middle of the next decade.

Following the European BSE crisis, *Australia* has overtaken the EU as the world's leading beef exporter, but is expected to come under increasing competition from the U.S. for that position. As an FMD-free exporter, Australia has been a major supplier of grass-fed beef for the processing industries in the U.S. and Canada, and has been increasing its role as a supplier of meat to a number of Pacific Rim markets, primarily Japan and South Korea.

Since 1985, Australian exports have increased 60 percent. Australia is projected to export 1.095 million tons in 1997, which will decline slightly to 1.075 million of exports in 1998 as herds are rebuilt. Because Australia produces primarily grass-fed beef, production and exports of beef have been subject to the uncertainties of weather and its impact on the quality and quantity of forage. Australia has gone through several periods of drought, which have often forced early liquidation of herds and a near-term jump in production, followed by production cutbacks as herds are rebuilt.

Although Australia has attempted to develop a feedlot industry both to offset forage shortfalls and expand into the higher end beef markets, feed-grain sufficiency remains a problem. Feed-grain imports to Australia are effectively prohibited by regulations preventing the incidental importation of unwanted pests—i.e., insects, weeds, or plant diseases. As long as imports of feed grains are blocked by sanitary barriers, the growth of Australia's feedlot industry will be limited.

New Zealand is the world's fourth-largest exporter, but exports have shown little growth since the mid-1980's, hovering around 500,000 tons. Like Australia, New Zealand is FMD-free and produces grass-fed beef. However, New Zealand beef production is dominated by dairy operations. New Zealand, which exports manufacturing-grade beef to the U.S. and Canada, has shown less interest than Australia in expanding into the growing Pacific Rim markets. Over the next 10 years, New Zealand's beef production is expected to decline marginally as low beef prices and weakening dairy prices encourage producers to look for more profitable alternatives to beef and dairy production.

Argentina remains the world's fifth-largest beef exporter, despite a fall in its share of global exports from 13 percent in 1985 to 9 percent in 1996. Traditionally, Argentina supplied the EU with fresh beef and the U.S. with processing beef. Recently Argentina has taken advantage of increased market liberalization under MERCOSUR—a customs union comprised of Argentina, Brazil, Paraguay, and Uruguay—to expand sales dramatically to Brazil. MERCOSUR imposes a common external tariff on members, and internal tariffs that are small and declining, or already zero. Argentina's sales to the U.S. will be limited by the U.S.'s WTO beef tariff-rate quota.

In the past, Argentina's FMD status had prevented it from expanding into the growth markets of the Pacific Rim. Now that Argentina has been successful in its FMD eradication program and has received approval of regionalized FMD-free status, the door could open to the rapidly growing beef import markets of Asia. Argentina could possibly compete better in Pacific Rim markets by shifting production toward grain-fed beef, because large supplies of FMD-free, grass-fed beef already exist in Australia and New Zealand. If Argentina adopts such a strategy, it is expected to overtake New Zealand as the fourth-largest exporter early in the next decade.

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Meat Industry Price Spreads: What Do They Indicate?

In October 1997, the farm-to-retail price spread for pork reached a record $1.62 per pound, attracting renewed attention to the difference between farm and retail meat prices. Current price spreads for Choice beef and broilers, although not at record levels, are also relatively high.

Over time, nominal price spreads tend to widen as inflation increases the costs of marketing, processing, and retailing. Yet the most compelling feature of meat price spreads for Choice beef, pork, and broilers is that, when adjusted for inflation, they have remained fairly constant or even decreased slightly over the past three decades.

Beef and pork price spreads measure the total costs (including profits or losses) for slaughtering, processing, and performing a multitude of marketing functions for a defined quantity and quality of product. Farm-to-retail price spreads usually widen when retail prices are rising rapidly or farm prices are falling. Consumers become concerned with high prices, farmers are concerned when prices are low, and both often look to the price spread for evidence of who is profiting. But price spreads alone do not indicate whether an industry is efficient or inefficient, or whether marketing, processing, and distribution costs are reasonable. Nor do they directly measure profitability.

Although the terms "spreads," "gross margin," and "profit margin" are often incorrectly regarded as synonymous, spreads by themselves do not indicate whether any segment of the marketing chain (i.e., farm, wholesale, or retail) is enjoying profits or suffering losses. *Price spreads* generally are larger than meat packer or retailer margins since they also include charges by marketing firms for other functions, such as transportation.

Gross margin is generally used by industry to mean the difference between what a retailer or packer pays for a product (per unit bought) versus what is obtained at the time of sale (per equivalent unit sold). Gross margin includes the costs of labor, packaging, overhead, and any profit. *Profit margin* refers to the difference between the gross margin and costs, and is usually expressed as a percentage of sales or of stockholders' equity. Price spreads reported by USDA are U.S. averages, whereas industry sources often cite gross margins and profit margins of individual firms.

Price spreads simply indicate differences in calculated values for a *consistent* equivalent quantity and quality of product as it is successively measured at the farm, wholesale, and retail levels. Consistent means that the same product (for example, a Choice steer's specific cuts) is measured each month and at each marketing level. *Consistent* price spreads provide an estimate of the distribution of final retail dollars among the farm, wholesale, and retail segments of the marketing chain and how the distribution changes over time. As such, price spreads provide a breakout of the consumer food dollar into the farmer's share and the marketing share *for the measured product.*

Congress, researchers, policy makers, industry participants, and the public are all interested in how the consumer's food dollar is allocated between farmers and the marketing system. By examining price spreads and their components, the timeliness and completeness of price adjustments among marketing levels, as well as variations in marketing spreads (e.g., transportation, processing, and distribution) can be monitored over time. If the spread is unchanged it implies that a price change at one level of the marketing system is being fully transmitted to another level. But retail prices and price spreads are only one set of information used in analyses of efficiency and performance of the total product marketing system. Additional information on costs and investments are required for an accurate and complete analysis.

However, the calculation and use of price spreads have some limitations. First, because of the difficulty in measuring price equivalencies across marketing stages for different products, not all price spreads are calculated. As a result, the calculated prices and price spreads do not reflect all livestock and meat products. For example, no Select grade or cow beef is included in the Choice beef spread, nor is a price spread computed for lamb. (For beef, this has been partially ad-dressed by development of the "all fresh retail beef" price series.)

Second, the various product prices and spreads are equated to carcass proportions even though retail food stores don't usually sell Choice beef, pork, or broilers in carcass proportions, so retail price estimates used in the calculation of spreads may not match retail store sales. The "all fresh retail beef" series gives a heavier weight to ground beef, but the Choice and Select portions of the all-beef calculations are still in carcass proportions. USDA's Economic Research Service (ERS) uses carcass proportions because no comprehensive direct sales volume data are available at the retail level. Therefore retail cuts are assumed to sell in carcass proportions.

Another limitation is that prices, and therefore spread calculations, do not account for any "volume effect" of promotional price specials. The Bureau of Labor Statistics (BLS) prices used to construct the product prices and spreads include promotional sale prices that are in effect at the time the price data are

What Are Price Spreads & How Are They Calculated?

Meat price spreads are the differences in prices or imputed values for a specified equivalent quantity and quality of product at identified points in the marketing channel during a specified time period. Thus, a price spread incorporates marketing, processing, and retailing costs. For example, the farm-to-retail price spread for Choice beef is the difference between the average retail price per pound and the farm value of the quantity of live animals equivalent to l pound of retail cuts. In other words, price spreads represent total marketing charges for processing and distribution between farmer and grocer. These marketing charges are not measured directly; instead, prices are observed and compared at successive points in the marketing chain.

The price spreads for Choice beef are monthly estimates by USDA's Economic Research Service of the differences among the values of a Choice Yield, Grade 3 steer sold by the feedlot; the value of Choice boxed beef from that steer as delivered to the city where it is consumed; and the value of Choice meat from that steer in the retail food store. Spreads reflect the decrease in weight from diverted hide, fat, bone, and other by-products, and the increase in value owing to assembling, processing, transporting, and retailing charges required to convert a farmer's Choice Yield, Grade 3 steer into retail cuts and hamburger sold to consumers. Values of variety meats and of by-products such as the hide are removed from the calculations through a by-product allowance. Currently 2.4 pounds of live animal is required to produce 1 pound of composite retail Choice beef cuts.

For beef, the farm-to-retail spread has two main components: farm to wholesale and wholesale to retail. The farm-level calculation is called the "net farm value," the wholesale level is the "wholesale value," and the retail level is the "Choice retail price." The farm-to-wholesale figure encompasses approximate charges for slaughtering and cutting cattle to primals and transporting the beef to the city where consumed. The wholesale-to-retail spread, accordingly, includes not only the gross margin for retailing, but also the charges for other intermediate marketing services, such as cutting to retail portions, wholesaling, local delivery to retail stores, and other merchandising.

For pork, the farm-to-retail spread is also made up of the farm-to-wholesale spread and wholesale-to-retail spread. The farm-to-wholesale spread covers approximate costs for slaughtering hogs, curing, smoking, and processing pork products, and shipping to the major consumer centers. The wholesale-to-retail spread represents local delivery cost, wholesaling, and the retailer's gross margin.

For broilers, there are two price spreads. One is called the retailer-to-consumer spread, which reflects the difference between the price retailers pay and the price at which they sell whole birds. It thus represents only the costs and profits or losses of the retailer in merchandising the product. The second spread is the wholesale-to-retail spread which reflects wholesale versus retail prices for a composite of whole-bird and chicken parts prices. This spread represents not only retail merchandising costs but also local delivery costs, warehouse costs, and possibly some broker costs. Because of the broiler industry's vertical integration of growers and processors, no farm-level price is calculated.

collected, but due to lack of pertinent data, no adjustments are made to reflect any increases in sale volumes that often accompany lower promotional prices.

A fourth limitation is that price spreads do not indicate profit levels of marketing firms. Data used for price spreads are based on published prices only and do not include direct estimates of firm or industry costs. A final limitation is that price spreads do not account for time lags in physical movement of product.

Price Spreads— Short & Long Term

Long-term fluctuations. Interpretation of meat price spread data over the long term depends on whether nominal or deflated data are used, and whether long or short time periods are considered. On a nominal basis, meat price spreads have increased dramatically since the early 1970's. But when deflated—i.e., adjusted for inflation—a different picture emerges. Price spread data indicate improvements in cost efficiency in slaughtering and processing for Choice beef and pork over time.

When deflated, the *pork farm-to-retail spread* is essentially flat, or decreases slightly over the past three decades, and the record spread of October 1997 is below many earlier price points. As for the component measures, the deflated *pork farm-to-wholesale spread* decreases over time, offsetting changes in the *pork wholesale-to-retail spread* which increases from 1970 to 1978 before leveling off.

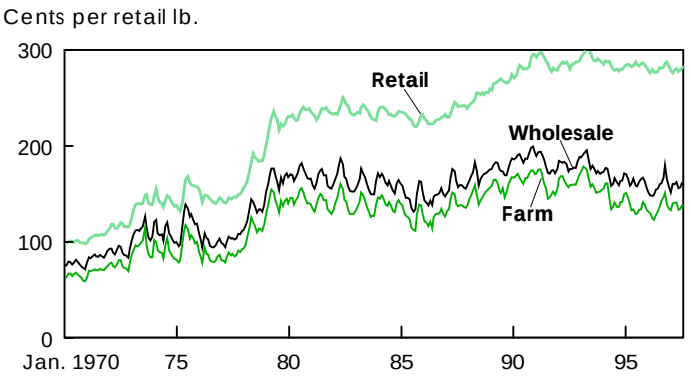
The deflated *farm-to-retail spread for Choice beef* declines slowly over the past three decades, also driven by the strong downward-trending *farm-to-wholesale spread*. The *Choice beef wholesale-to-retail spread*, on the other hand, is fairly level since 1980.

The *broiler wholesale-to-retail spread* is fairly stable on a nominal basis, but decreases when deflated. Because the broiler industry is integrated between broiler growers and processors, no farm-level price or farm-to-wholesale spread is calculated.

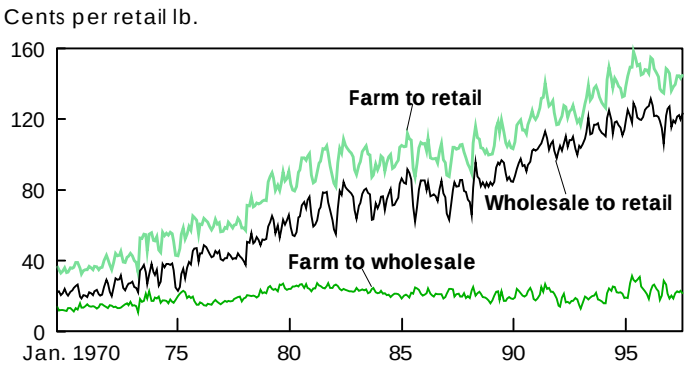
The farm-value share of retail Choice beef and pork prices has decreased over time, at least partly because marketing costs have paralleled inflation while cattle and hog prices have lagged behind. Farm-value share has been decreasing for most agricultural commodities. The farm-value share for all U.S. domestically raised foods has declined from 41 percent in 1950 to 23 percent in 1996.

Beef Prices and Price Spreads*

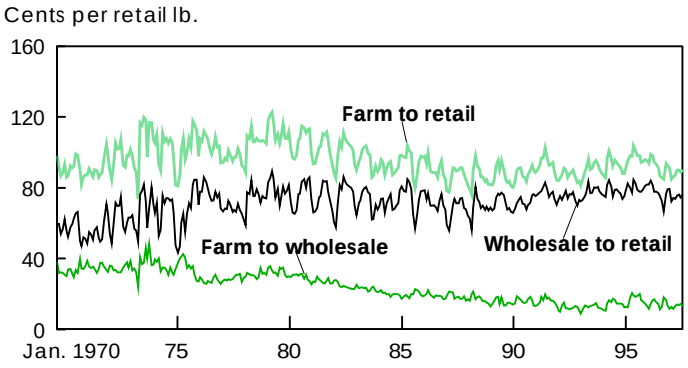
Nominal Prices



Nominal Price Spreads

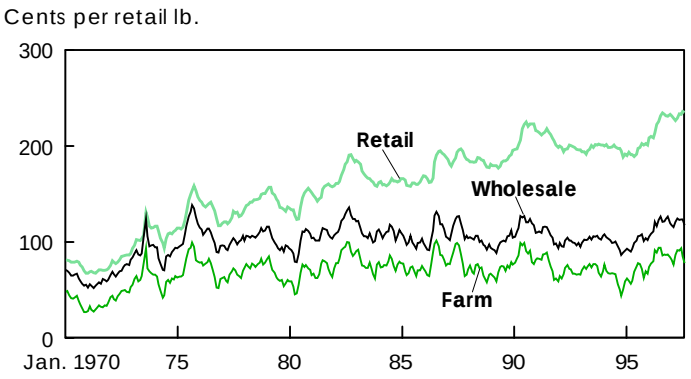


Inflation-Adjusted Price Spreads

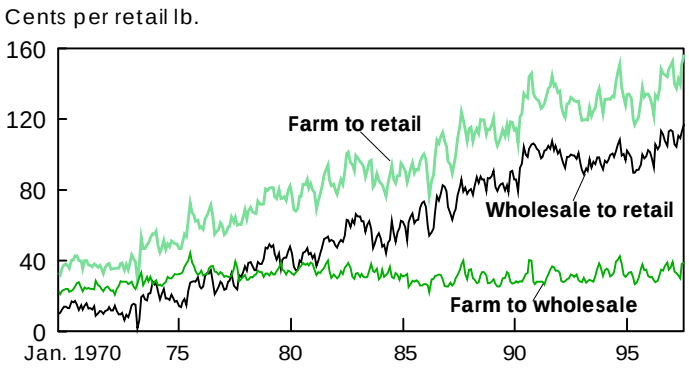


Pork Prices and Price Spreads

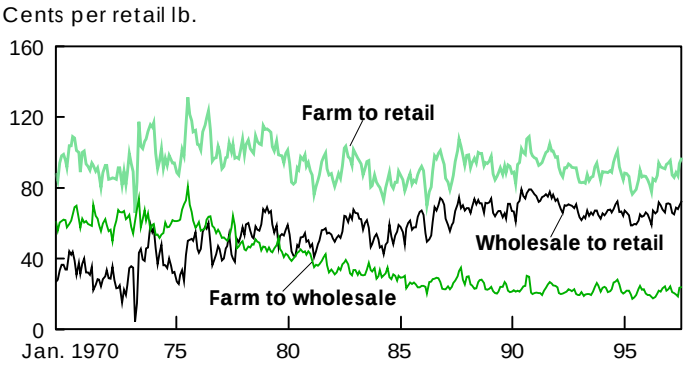
Nominal Prices



Nominal Price Spreads



Inflation-Adjusted Price Spreads



Monthly price and price spread estimates. 1982-84 = 100. Nominal prices are deflated using Bureau of Labor Statistics "all urban" consumer price index for all items.
*Choice, Grade 3.

Economic Research Service, USDA

The fall in the farm-value share reflects the increase in services provided by marketing firms over time, and in the cost of those services. The index of food marketing costs, which measures price changes in marketing inputs such as labor, packaging, transportation, and energy, rose 336 percent between 1968 and 1996.

Short-term fluctuations. Given the longrun trend toward higher marketing costs, one might expect price spreads to grow more or less steadily over time. But instead, substantial short-term variation occurs.

Short-term fluctuations in meat price spreads reflect the tendency for retail

Price Spreads: A Brief History

Price spreads for meat have been computed since the early 1920's when Congress asked USDA to undertake special studies of marketing margins for livestock. In 1934, at the request of livestock producers, USDA developed a statistical series to measure changes in marketing costs for a number of agricultural commodities. Farm-to-retail price spreads have been published regularly since 1942.

Enactment of the Research and Marketing Act of 1946 increased the attention given to measurement and analysis of marketing spreads and costs. The 1946 Act directed USDA "to determine costs of marketing agricultural products in their various forms and through the various channels...."

Within USDA, the Economic Research Service (ERS) has been responsible for calculating Choice beef price spreads since 1962. Meat is one of nine product groups of U.S. farm-originated foods included in USDA's market basket. Red meat accounts for about one-third of the total market basket.

Between 1978 and 1981, ERS used data exclusively from its weekly retail meat price survey for computing retail prices and price spreads. Since 1981, ERS retail meat price series have relied on Bureau of Labor Statistics (BLS) retail price data for basic information. Currently price spreads for Choice beef, pork, and broilers are calculated. An "all fresh beef" retail price series began in 1987 which increased the share of ground beef included in carcass-weighted Choice and Select prices. No live price or price spread is calculated for the "all fresh beef" price because weighting the many types of live beef animals represented would require data not currently available.

Pork retail price weights were changed in 1978 to reflect changes in carcass proportions. The Choice beef retail price series weights were changed in 1990 to reflect use of 50/50 trim in the ground beef calculation, more boneless cuts, and closer trimming of fat. Broiler prices used only "fresh whole bird" retail prices until 1992, when a composite of whole and parts prices was added at retail. Whole-bird prices continue to be published. Turkey prices are for a frozen whole bird.

ERS is interested in improving the accuracy and availability of data and information on retail prices and price spreads for meats. Suggestions for improving price spreads were obtained at a USDA conference on price spreads held in Kansas City in December 1996. Future improvements under consideration include:

- updating and revising the pork spreads using new price series developed by USDA's Agricultural Marketing Service and other sources;
- developing a volume-weighted all-pork retail price to represent, as nearly as possible, the average price that retailers receive for pork;
- improving the volume-weighted all-beef retail price reflecting the average price retailers receive for fresh beef;
- developing an all-grades-for-beef price spread series and an all-grades-for-pork price spread series by calculating all grade price series at the live and wholesale levels;
- adding more BLS retail prices if they become available for beef, pork, and broilers; and
- monitoring scanning technology and data, and incorporating these data as they become available.

In January 1998, BLS will make changes in the number and composition of the retail meat cuts for which BLS will publish average prices. Meat retail prices and price spreads will be adjusted to reflect these developments.

Farm-to-retail price spreads are currently published in Agricultural Outlook*;* Livestock, Dairy, and Poultry Situation and Outlook*; and the* Food Cost Review*, and are released by ERS AutoFAX and on the Internet.*

price changes to lag behind farm price changes. If there is no lag—i.e., changes in the farm price are immediately reflected in retail prices—the price spread would rise only with inflation and other costs. But with a lag in price transmission, the price spread is nonconstant, and at times quite variable.

Two reasons are cited by the industry for the lag in price transmission. First, the delay in changes between farm and retail prices is often attributed to the time it takes to move products from farms to retail outlets, so that the prices of products currently in stores reflect earlier farm prices. In addition, retailers set prices for advertising purposes a week or more ahead, thus limiting rapid adjustment to sudden price changes. As a result, farm-to-retail price spreads frequently narrow while farm prices are increasing, and widen while farm prices decrease. The lag tends to be shorter when farm prices are rising.

The second reason for the lag in price transmission is fear of negative consumer reaction to frequent price changes (especially price increases) which motivates stores to "smooth out" such changes. In the long run, however, the marketing system cannot keep the retail price of meat constant and still balance production and consumption, so retail prices must eventually adjust.

ERS research using monthly price data shows that price adjustments at farm and wholesale are nearly concurrent. The retail price, however, follows price changes at the farm and wholesale levels with a lag distributed over nearly a year. Research also reveals a distinct asymmetry in retail response to farm-level price changes. Upward movements in farm prices are followed by retail price adjustments about 24 percent more quickly than downward farm-level price movements. A partial explanation may be that retailers expect downward movements to be

temporary and wish to avoid marking prices down and then back up again.

A recent example of the lag in price transmission occurred during the July-to-August period of 1997 when the net farm value for pork dropped 8 cents per retail pound, the wholesale price remained about the same, and the retail price went up 3 cents. The farm price fell another 7 cents from August to September, the wholesale price fell 6 cents, and the retail price decreased only 1 cent. Then in October, the farm price decreased another 5 cents, while the retail price was flat. As a result, the October farm-to-retail pork price spread expanded an additional 5 cents.

Variation Evident in Wholesale-Retail Spreads

The absolute levels of spreads between wholesale and retail prices of beef and pork have increased irregularly over time. ERS based its recent research on the factors driving wholesale-to-retail price spreads for beef and pork on the concept that the retail price is essentially the wholesale price plus a markup that reflects grocery stores' costs of preparing and marketing meat. As such, inflation would tend to make costs, and consequently the wholesale-retail spreads for beef and pork, rise over time.

One explanation advanced for the widening of spreads over time is that, in addition to rising costs, increasing levels of service are provided with meat sold at retail outlets. Among the factors driving demand for service is increasing consumer income. However, ERS research has found no relationship between price spreads and consumer income. Another set of factors that could drive service demand are the societal trends that have decreased the amount of time available for food preparation. However, simple trend measurements—albeit an imperfect proxy for this phenomenon—also failed to show any relationship with meat price spreads. The conclusion emerged that longrun price spreads appear to follow inflation.

It is obvious, however, that in the short run, price spreads do not track inflation closely. Price spreads for beef and pork fluctuate quite a bit from month to month. Even after correcting for inflation, wholesale-to-retail price spreads fluctuate, on average, about 5 percent per month (in absolute terms). One factor in this volatility is that retail prices seem to lag behind wholesale prices.

ERS research showed that increased volumes of meat consumption are associated with slight shortrun increases in the wholesale-to-retail spread. However, the effect of higher sales volume is only temporary, increasing nominal price spreads for only about 3 months. In the typical month, the sales-volume effects cause beef and pork spreads to vary by about 1 percent. In the longer term, sales volume has little impact on wholesale-to-retail spreads.

While wholesale-to-retail nominal price spreads have widened over time, long-run price spreads, when adjusted for inflation, have remained fairly constant.

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January Releases—USDA's Agricultural Statistics Board

The following reports are issued electronically at 3 p.m. (ET) unless otherwise indicated.

January

2 *Cheddar Cheese Prices (8:30 am)*
Dairy Products
6 *Poultry Slaughter*
7 *Broiler Hatchery*
9 *Cheddar Cheese Prices (8:30 am)*
Cotton Ginnings (8:30 am)
Crop Production (8:30 am)
12 *Egg Products*
13 *Crop Production, Annual (12 noon)*
Grain Stocks (8:30 am)
Rice Stocks (8:30 am)
Winter Wheat & Rye Seedings (8:30 am)
Potato Stocks
14 *Broiler Hatchery*
Turkey Hatchery
15 *Milk Production*
16 *Cheddar Cheese Prices (8:30 am)*
Turkeys
Vegetables
Vegetables, Annual
21 *Broiler Hatchery*
Cold Storage
22 *Catfish Processing*
Noncitrus Fruits & Nuts, Preliminary
23 *Cheddar Cheese Prices (8:30 am)*
Cattle on Feed
Livestock Slaughter
26 *Cotton Ginnings (8:30 am)*
27 *Peanut Stocks & Processing*
28 *Broiler Hatchery*
29 *Layers & Egg Production, Annual*
30 *Cheddar Cheese Prices (8:30 am)*
Agricultural Prices
Cattle
Capacity of Refrigerated Warehouses
Chickens & Eggs
Sheep & Goats

Jack Harrison

Value of Farm Real Estate Climbs Again In 1997

Agricultural real estate values in the U.S. continued to climb during 1996. USDA's estimate for the national average value of all agricultural real estate as of January 1, 1997 is $942 per acre, up 5.8 percent from a year earlier. The major factor in the value of most agricultural land continues to be the long-run returns expected from commodity production. However, nonfarm factors, such as pressure from residential and commercial development, or the potential for recreational use, play an increasingly important role.

The 1997 average per-acre agricultural real estate value (land and buildings) was up 3.8 percent, in inflation-adjusted terms, from 1996. Several states showed double-digit growth, with the largest increase estimated at 11 percent. Average values for the Lake States, Corn Belt, Mountain, and Pacific regions all increased at rates that equaled or exceeded the national average. No states showed a decrease in average farm real estate value, though several were steady or up only slightly over 1996.

State average cash rents for cropland and pasture in 1997 were generally up from 1996. Only four states registered a decline in irrigated or nonirrigated cropland. The Appalachian region reported the largest gains in cropland rents, followed by the Lake States region.

USDA surveys, based on information obtained from farm operators, have generally been consistent with the results of regional surveys which rely on alternative procedures and respondents. For example, recent information from regional Federal Reserve surveys of agricultural lenders indicate that agricultural real estate values have continued to increase in 1997. Results from the Florida Land Value Survey, conducted by the University of Florida, note that the state has struggled recently with poor market prices for citrus products and strong competition from foreign vegetable producers, which have been reflected in a leveling of average prices for farmland. These conditions most likely will continue to impede increases in average land values in the southern and central parts of Florida.

The increase in agricultural real estate values during 1996 marks the 10th consecutive year that values have risen since the low point in the national average in 1987 following the farm financial crisis of the 1980's. Since 1987, the national average agricultural real estate value has risen 57 percent, which translates into a 15-percent gain when adjusted for inflation.

While the national average value bottomed out in 1987 at $599 per acre, a number of states had reached their lows before then, and many others, located mostly in the West, did not reach their lowest levels until several years later. Four states in the Northeast never actually experienced a decline in agricultural real estate values during the 1980's.

Patterns of growth in farm real estate values reflect the diverse nature of agriculture across the U.S. States in the Northeast, Lake States, Corn Belt, Northern Plains, Appalachian, and Southeast regions all began their recoveries in 1987 or before. Since then, four of these regions have exhibited gains of 20 percent or greater, in inflation-adjusted terms, for the period. The other two, the Southeast and Northern Plains, showed growth of 17 and 11 percent.

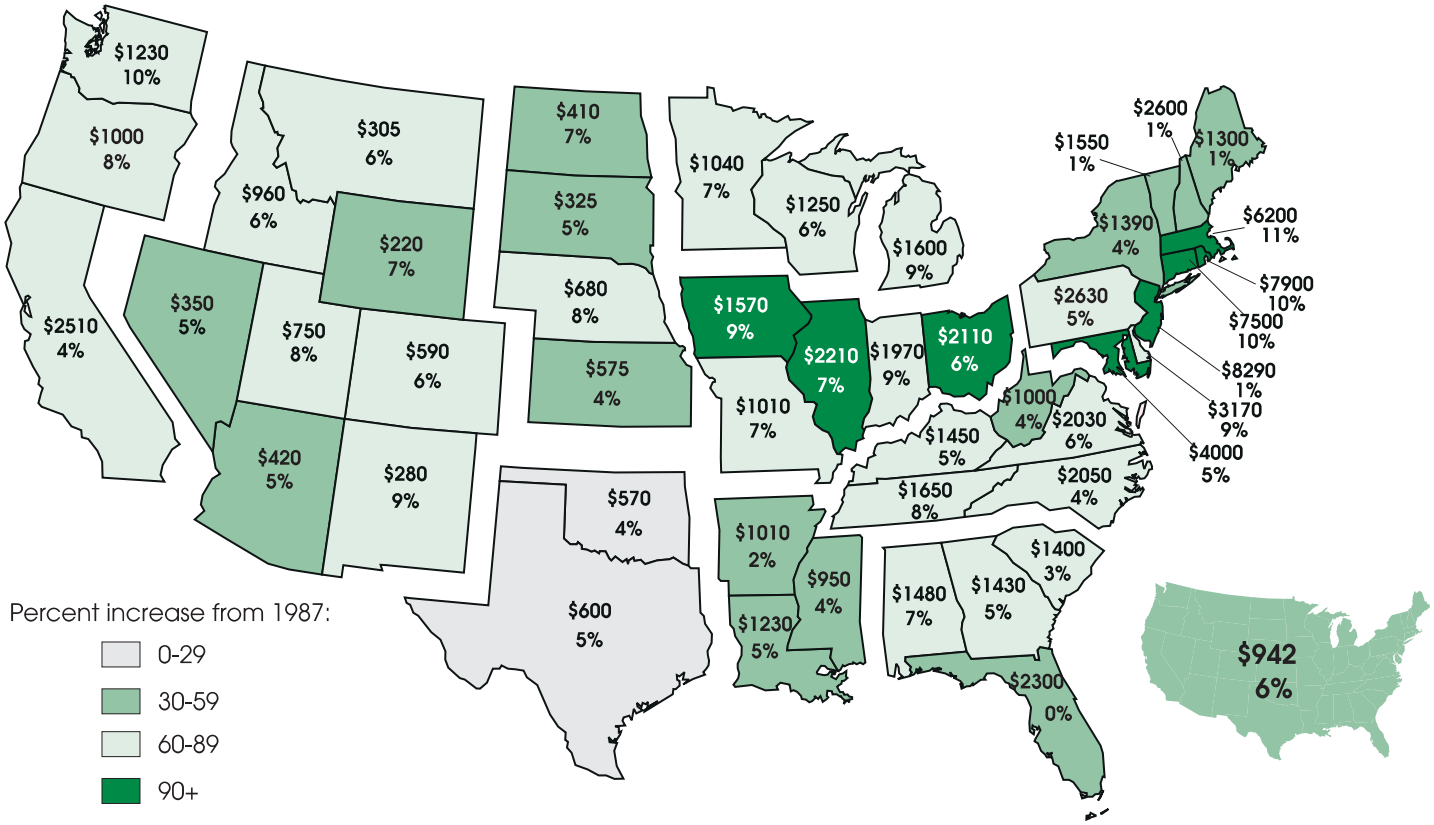
States in the western regions followed a different trend. Texas, Oklahoma, and several of the Mountain States did not reach their low values until the early 1990's. Agricultural real estate values in Texas in particular have tended to move in a countercyclical pattern. Values in the state are currently 41 percent, in inflation-adjusted terms, below the high value of 1985, a year when most other states were already experiencing falling values. The inflation-adjusted value in 1997, however, is 10 percent above the low set for the state in 1993, when most other states had already shown significant recovery.

Hedonic Analysis of Farmland Values

Hedonic analysis is a method of economic modeling especially suited to valuing the various characteristics that are bundled in one marketable asset or product. This method is often used to study house sales, since a house is sold as a bundled package of individual characteristics (e.g., square footage, number of rooms, proximity to schools). Hedonic analysis facilitates the determination of underlying implicit values (prices) that each characteristic contributes to the overall value of the bundle making up a particular good or service.

Application of hedonic methods to the analysis of farmland is straightforward, as farmland also consists of bundled characteristics that are valued and sold as a unit. A parcel of farmland consists of unique amounts of various characteristics that contribute to agriculture-related returns, including soil properties, climate, suitability for high-value crops, potential for irrigation, and eligibility for enrollment in government programs. Farmland may also possess other characteristics that are not agricultural in nature yet contribute to the value of the land, such as proximity to urban areas, recreation sites, or major highways, or location in a particularly scenic area.

Farmland Values Rose in Nearly All States in 1997, and Are Up Dramatically from 1987 in Most States



Average value per acre on January 1, 1997, and percent increase from 1996

Economic Research Service, USDA

Farm & Nonfarm Factors In Real Estate Values

The causes of differences in land values among states and regions are as varied as agricultural land itself. Some of the difference is clearly the result of varying market and growing conditions that favor certain commodities at given times, and consequently the states and regions that produce them. For example, strong export markets for grains have contributed to optimistic earnings expectations for land suited to growing grains.

While a major component of the value of farmland in many areas reflects the returns expected from commodity production, nonfarm factors play a primary role in other areas. USDA's Economic Research Service (ERS) has been studying agricultural land values in order to determine the influences of agricultural and nonagricultural factors on this critical asset. New research using hedonic analysis, a method for valuing the individual attributes of one marketable asset or product, has helped to determine the relative land value contributed by characteristics such as soil properties, climate, and proximity to urban areas.

Not surprisingly, the relative contributions of the various agricultural and nonagricultural characteristics to overall value vary significantly across the nation. A mild climate, plentiful precipitation, and productive soils tend to be positively related to the value of the land. The existence of fruit or nut trees, and vineyards, contributes additional value to a parcel.

The presence of an irrigation infrastructure on a parcel of farmland is a strong contributor to the value of that parcel. This influence is especially strong in many western states, where irrigation is vital to the viability of any agriculture enterprise. In the East, where irrigation is less essential, it provides a means of reducing risk by limiting the impact of fluctuations in precipitation that naturally occur.

The states with the greatest reliance on irrigation, and thus where it has the largest impact on land values, can be found in the Mountain region. Irrigation is important but less vital to production in the Pacific and Northern and Southern Plains regions. While land values in the Pacific region tend to be higher on average than those in the Mountain region, the

About the Survey

USDA's June Agricultural Survey (JAS), conducted by the National Agricultural Statistics Service (NASS) and the source of farmland values used in ERS research, is based on an area frame which divides the U.S. into "segments" representative of land uses across the nation. This area frame design, coupled with NASS's geo-referencing of sample segments with latitude and longitude information, makes it possible to link farmland value data with other geographically based data sets, notably USDA's National Resources Inventory (NRI) and the Census of Agriculture. These data sets contain considerable information on farm production practices and site-specific environmental conditions.

As a result, the JAS is not only a survey of crop acreage, livestock inventories, and farmland values, but also provides the material for a rich data set on resource use and production practices for the entire nation. These data will facilitate research on land, resource, and environmental issues important to the agricultural community.

This is the first year that NASS has produced the current-year estimates of farm real estate value that update the USDA series on agricultural real estate values. Previously, ERS provided USDA's state-level land value estimates using the Agricultural Land Values Survey (1984-94) and the JAS (1995-97). NASS was primarily responsible for survey design and implementation, while ERS participated in questionnaire design and prepared estimates. This year and in future years, NASS will prepare the estimates as well as conduct the survey.

State estimates for 1997 are available from NASS by calling the order desk at (800) 999-6779 or the USDA AutoFAX at (202) 720-2000. Estimates are also available on the NASS Home Page at http://www.usda.gov/nass/.

proportion of the land value contributed by irrigation is much greater in the Mountain States. Irrigation is a factor in land values in the Delta and Southeast regions, but relative to other irrigated regions, its impact is weakest there.

The influence of direct government payments on land values, ERS found, is strongest in the Northern Plains and the Corn Belt, as well as in scattered areas of the Southern Plains, Northeast, and Mountain regions. These findings support the contention that government payments, to the extent that they are stable and predictable, contribute to expected returns and are therefore capitalized into the value of the land. As government payment programs are phased down over the next 5 years, a commensurate decapitalization of payments would be expected to occur, contributing downward pressure on values. However, observed market values might not actually fall, because changes in other value determinants may have an offsetting upward effect.

Among nonagricultural elements determining farmland values, ERS has found that the demand for farmland in urban and urbanizing areas, generated by residential, commercial, and industrial development, is the predominant influence on famland values. The value of land that has development potential tends to be much higher than its value in agricultural use.

The impact of population is obviously important in heavily populated areas of the Northeast, California, Illinois, Ohio, Florida, and Texas, and to a lesser extent in the Appalachian region and several of the Mountain States—notably Utah, Arizona, and New Mexico. These mountainous regions have seen growing populations and attendant upward pressure on the value of limited private land—particularly land with potential as residential sites offering scenic mountain views or remoteness from heavily populated areas.

Demand for land for recreational purposes has also been found to contribute to land values, but this is a much less important determinant of value in most areas of the country. The farmland itself may be jointly used for recreational activities such as hunting or fishing. Some farmland is also located near facilities that provide recreation services, such as parks for camping or boating, ski resorts, beaches, cultural amenities, and historic sites.

Development of recreational facilities, campgrounds, ski lodges, beach houses, and the accompanying commercial enterprises (e.g. recreational equipment suppliers, gas stations, and grocery stores) require additional land. ERS has found that while recreational pressure is at work throughout the nation, it is especially prevalent in the Mountain and Northeast regions.

Returns from commodity production are still the major determinant of the value of most agricultural land. However, as the nation's population grows, nonfarm demands will increasingly contribute to the value of agricultural land.

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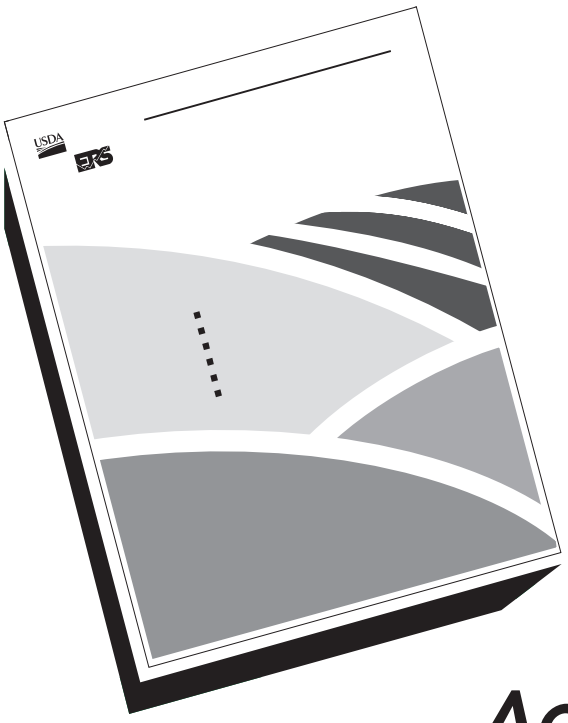

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Special Article

American Meat Institute

The U.S. Pork Industry: As It Changes, Consumers Stand To Benefit

The entire U.S. pork industry—from farmer to processor to store or restaurant—is undergoing a transformation, in part because consumers want high-quality products at reasonable prices. Technological advances in production—including innovations in genetics, housing, and handling equipment—provide opportunities for hog producers to expand operations and to have more control over the quality of hogs produced.

Just 10 years ago, a third of all hogs were raised on farms that had more than 1,000 animals. Today, more than two-thirds of all hogs are produced on farms with more than 1,000. At the same time, pigs are being selectively bred to produce leaner, higher quality, and competitively priced meat.

Production for the open market is being replaced by multi-year contracts and vertically integrated operations—many pork packers and processors obtain a steady supply of high-quality hogs by entering into contractual arrangements with independent producers or by direct ownership of production facilities and breeding operations. In 1970, just 2 percent of hogs slaughtered were obtained through contracts or integrated operations. By 1993, the proportion had increased to 11 percent, and packers expect to obtain 29 percent of hogs through contracts or integrated operations in 1998.

How the hog industry is organized and how it does business affects consumers through price and product selection. Today's households want convenient food products with quality assurances, as demands on their time increase. These developments have encouraged firms to seek greater control over product quantity and quality. With time pressures and incomes rising, more food is prepared away from home and sales by restaurant chains and other prepared-food retailers have increased. Suppliers must increasingly be able to provide large quantities of consistently high-quality, uniform products on a regular schedule. For example, consumer demand for fast-food breakfast sandwiches featuring bacon and sausage, and for bacon-topped fast-food hamburgers has opened a new outlet for millions of pounds of pork products.

Health consciousness and ethnic diversity have also created new opportunities for delivering pork products. Pork producers and packers are introducing new products such as Smithfield Foods' "Lean Generation" branded line of fresh pork products. Ethnic niche markets are emerging for specialized pork products such as chorizo Mexican-style sausage for Mexican restaurants and the growing Hispanic population.

Increased Coordination Affects Quality, Packer Costs . . .

Producers use selective breeding to produce hogs with desirable characteristics such as disease resistance, high lean-to-fat ratio, and fast growth. These carefully selected hogs are fed to market weight prior to sale to packers. In the first processing stage, packers slaughter the hogs and divide the meat into wholesale pork cuts. Three-fourths of pork is further processed into sausage, hot dogs, bacon, and other products. Finally, pork products are sold to retailers and eating places.

New arrangements in vertical coordination of hog production and packing stages can reduce the costs of pork production. By contracting or by integrating, packers may ensure a large, stable flow of hogs into the packing plant, reducing average costs by minimizing the under- and overutilization of plant facilities.

Contracting or integrating can also reduce packer costs by improving the quality of hogs slaughtered. Quality affects processing time and labor costs as well as the quantity of high-value fresh meat cuts per hog. For example, hogs with excessive fat require more trimming and produce less salable lean meat per hog. In contrast, fewer lean hogs are needed by the packer to produce a given quantity of lean pork. A 1992 study for the National Pork Producers Council estimated that excessive fat problems cost packers $6.32 for each hog slaughtered. USDA's Economic Research Service calculated that to achieve savings of $6.32 per animal by eliminating excessive fat, each hog would need to be 19 percent leaner than the average.

Packers also incur costs from trimming and discarding damaged and unusable meat, the result of other characteristics controlled by the hog producer. Consumers do not want pale, soft pork that has low water-holding capacity. When hogs are stressed by loading and handling, their meat can have an unattractive appearance to consumers and can be less juicy after cooking. Pork with

these quality problems may have to be used in further processed products, like sausage, rather than as higher value fresh pork.

Quality-related packer costs are controlled by the hog producer through the choice of genetic stock and through proper management, such as reducing the incidence of improperly injected medication and rough handling of hogs. Long-term contracts and vertical integration can ensure consistent supplies of lean, high-quality hogs to packers.

The use of long-term contracts and vertical integration can also reduce packer costs of acquiring hogs, such as operating buying stations, paying salaried or commissioned buying agents, and transporting hogs to packing facilities. A meat processing company, for example, recently engaged a livestock exchange to manage buying stations and supply the quantity and quality of hogs specified. This added 48 cents to the cost of each hog supplied to the processing firm, not counting the costs of transportation and maintaining buying station facilities. Vertically integrated packers who produce their own hogs, and packers who enter into long-term contracts with independent producers, do not incur these additional management fees.

. . . & Retail Prices

By lowering the costs of production and increasing the quality of pork products, long-term contracting and vertical integration can affect retail prices. Changes in average prices will depend on the proportion of hogs produced through these coordinating arrangements, affecting the level of cost reductions and the degree of product quality improvements. Price changes will also depend on how highly consumers value the quality improvements.

ERS used an economic model of the U.S. pork industry to estimate the potential effects on pork prices when some producers transfer hogs to packers through contracts and vertical integration instead of through the open market. The model allows for simultaneous shifts in supply and demand, and corresponding adjustments in quantities and prices. The model does not consider costs of differentiating lean pork from standard pork, such as label redesigning, or other costs such as monitoring and enforcing contracts, nor does it consider competitive pressure on prices from imports as supplies of leaner pork increase.

ERS estimated the change in retail pork prices that results from increased vertical coordination under six scenarios. The change in price under each scenario depends on the proportion of hogs obtained by packers through long-term contracts and integration, and the value placed on leaner pork by consumers.

According to a survey conducted by Iowa State University and University of Missouri researchers for USDA's Packers and Stockyards Program, 11 percent of hogs obtained from contracts and integration were produced under these arrangements in 1993. That percentage is expected to increase to 29 percent by 1998. The 11-percent level was adopted as a *low-proportion* scenario for this analysis, while the 29-percent level was adopted as a *high-proportion* scenario.

What is Vertical Coordination?

A food marketing system consists of several stages of production and distribution, with value added to the product at each stage. In the pork industry, these stages include *breeding*, where genetic stock is selected for hog producers; *hog production*, where a breeding herd is maintained to produce pigs that are nursed and grown to market weight; p*acking/processing*, where hogs are slaughtered and divided into wholesale pork cuts, approximately 75 percent of which is further processed; and the *retail* stage, including the operations of restaurants and grocery stores.

Vertical coordination refers to the systematic transfer of product from one stage to the next in a "vertical" direction, from production of the raw commodity to delivery of the finished product to consumers. Vertical coordination can be achieved in many ways, including open market exchange, contractual arrangements, and vertical integration.

In *open market exchange*, no commitments are made for selling the product before it is ready for sale. The finished product is taken to market and sold at the prevailing, or "spot," price. Producers, processors, and retailers rely on the market both to deliver the quantity and quality of inputs they desire and to provide an outlet for their own products.

Under *contractual arrangements*, purchasers have greater control over production compared with open market exchange, because commitments are made prior to completion of production. For example, contracts between independent hog producers and packers may specify the quantity and quality of hogs to be delivered per day, per week, or on a certain date. They may also specify the genetic strains of hogs to be delivered.

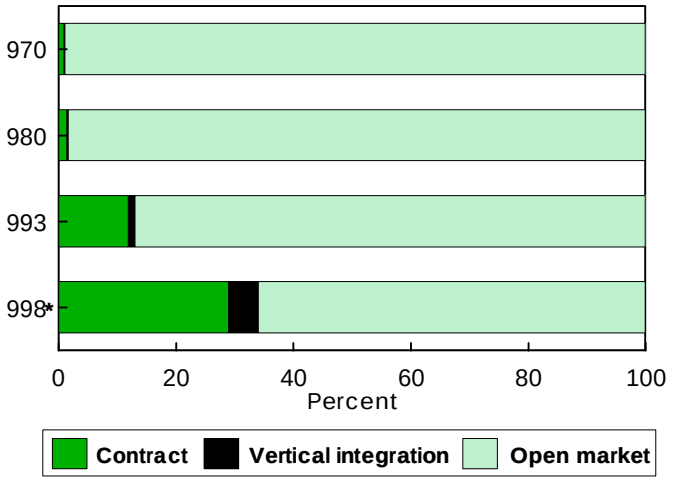
Although less common, in some contractual arrangements packers may own the hogs and contract with producers to feed and house them until ready for slaughter. Large packers and large hog producers typically use *long-term*, or *multi-year contracts*, usually 4 to 7 years.

Vertical integration refers to ownership of successive stages of production by a single firm. Products are transferred from one stage to another according to management decisions. For example, a single firm may own hog production operations and packing facilities, so the quantity and quality of hogs available for packing are under the direct control of the firm.

Methods of achieving vertical coordination can be classified based on the degree of control that firms have over production. At one end of the spectrum is open market exchange, which represents the least control over production. At the other end of the spectrum is vertical integration, which represents the most control. Contracts fall between, representing varied, intermediate degrees of control.

Special Article

Growing Share of Hogs Delivered for Processing Via Long-term Contracts or Vertical Integration



*Estimated.
Sources: Economic Research Service, and Packers and Stockyards Administration, USDA.

Economic Research Service, USDA

In this analysis, obtaining hogs through contracting or vertical integration would lead to reduced packer costs in two ways. ERS assumed long-term contracts and vertical integration between large hog producers and packers produced 19-percent leaner hogs, which would reduce packer costs by $6.32 per hog (estimates of the 1992 National Pork Producers Council study). Packers were also assumed to save an additional 48 cents per hog in acquisition costs as a result of long- term contracting or vertical integration, based on arrangements described above between a meat processing company and a livestock exchange.

The amount consumers are willing to pay for 19-percent-leaner pork is uncertain. Therefore, three alternatives were examined for both low-proportion and high-proportion production scenarios. In the first alternative, consumers place *no value* on leaner pork. In the second, consumers place a *low value* on leaner pork and are willing to pay an additional 8.2 percent of the average retail price of all pork for the leaner fresh pork products. The 8.2-percent figure was derived from a market survey by Indiana State University and North Carolina State University researchers of what consumers would pay for 10-percent-leaner pork. Under this alternative, willingness to pay for leaner pork was assumed to apply only to fresh pork, because processors can adjust the fat content of processed pork products without relying on changes in hog production.

In the third alternative, simulating a *high value* placed by consumers on lean pork, the willingness to pay a premium for 19-percent-leaner pork was also assumed to be 8.2 percent above the average retail price of all pork. The price premium, however, was applied to both fresh and processed pork. This expansion of the quantity of pork for which consumers would pay a premium in this scenario was intended to reflect improvements in pork quality other than leanness that could be expected from increased vertical coordination. These other quality improvements would impact processed products, as would greater availability of lean pork for some processed products, such as reduced-fat bacon.

When 11 percent of hogs are obtained by contracting and integration (low-proportion scenario), changes in average retail pork prices range from a reduction of 0.39 cent—slightly over a third of a cent—per pound to an increase of 0.08 cent per pound, depending on how consumers value leaner pork. If 29 percent of hogs are obtained through contracts and integration (high-proportion scenario), prices change by a larger amount, ranging from a reduction of 1.01 cent per pound to an increase of 0.19 cent per pound.

The largest reductions in retail price in these two examples occur when consumers place no value on leaner pork. In the low-proportion scenario (11 percent of hogs obtained through contracting and integration), retail prices fall by 0.39 cent per pound as leaner meat reduces packers' costs, whereas in the high-proportion scenario (29 percent of hogs obtained through contracting and integration), retail prices drop by 1.01 cent per pound.

When consumers place a low value on leaner pork, paying a premium only for leaner fresh pork, the reduction in the retail price resulting from lower packer costs is partially offset by consumers' willingness to pay a higher price for leaner fresh pork. Prices still fall by 0.27 cent per pound for the low-proportion scenario and 0.7 cent per pound for the high-proportion scenario because of lower packer costs, but reductions are less than those in the no-value scenario.

When consumers place a high value on leaner pork, valuing both fresh and processed, the retail price increases because consumers' willingness to pay a higher price for leaner pork more than offsets price reductions due to lower packer costs. The average retail price of all pork increases 0.08 cent per pound in the low-proportion scenario and 0.19 cent per pound in the high-proportion scenario. Consumers demand more pork at the current price because it is leaner, so the price increases induce retailers to provide more pork. Without the higher price, consumers would not get the quantities of leaner pork that they demand. So, although the average retail price is higher, consumers benefit because there is a larger quantity of higher quality pork. Without the reduction in packer costs, however, prices would increase even more.

The model results suggest that changes in methods of vertical coordination do affect average retail prices for pork. The direction and magnitude of the change depend on the extent of change in industry organization and on how highly consumers value the leaner pork that results. In each scenario, the retail price changes by less than a percent. These changes may be underestimated, however, because other pork quality attributes—such as moisture retention—and lower costs due to greater plant utilization were not included in the analysis. In addition, more accurate assessments of health benefits from consuming leaner pork may alter the changes in the retail price. For example, new

information that supports or confirms the health benefits of lower fat diets may cause consumers to pay more than the 8.2-percent price premium assumed in this analysis.

Under the six scenarios, the potential benefits for consumers range from $60 to $693 million over a year from the combined effects of lower costs of pork production and improved pork quality. These benefits are calculated using an economic measure of consumer well-being that considers the quantity of pork consumed, and the difference between the higher price consumers would be willing to pay and the price actually paid.

Public Policy & Vertical Coordination

As the pork industry continues to respond to new technology and changes in consumer lifestyles, contractual arrangements and vertical integration serve an economic function that can benefit consumers. Consumers have a significant interest in changes occurring in vertical coordination in the pork industry, and in other agricultural sectors, because of potential effects on retail prices and on the availability of high-quality food products. But the public may also have concerns about such issues as the effects of the size, location, and employment patterns of pork producers and processors on rural communities, and the impacts of new organizational methods on independent producers and small family farms.

In addition, as the scale of pork production operations has increased, so have public concerns about livestock waste. Media coverage has heightened public perceptions of problems such as odor and water quality. However, under current law, water treatment and discharge on pork production facilities with more than 2,500 hogs are governed by required permits. Although smaller operations typically adhere to similar treatment systems, they are not required to have permits. Moreover, increased scale of operations typically reduces the per-unit costs of suitable waste treatment.

The disposition of animal manures on cropland has received particular attention as a result of concerns about runoff into rivers and streams. Many producers have responded to the waste management problem with a combination of measures, including nutrient management plans and conservation buffers such as filterstrips, to guard against waste-related nutrients or other contaminants entering water bodies.

Policymakers play a role in the types of vertical coordination arrangements that develop, through antitrust legislation that can directly affect organizational structure, and through policy-supported research and market information services that play an important role in the effectiveness of open-market exchange. The challenge for policymakers will be to facilitate coordination across the stages of production in the most efficient way, while at the same time discouraging anticompetitive behavior and any other impacts potentially harmful both to consumers and producers.

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U.S. & Foreign Economic Data

Table 2—U.S. Gross Domestic Product & Related Data

				1996				1997		
	1995	1996	1997	I	II	III	IV	I R	II R	III P
	Billions of current dollars (quarterly data seasonally adjusted at annual rates)									
Gross Domestic Product	6,947.0	7,265.4	7,636.0	7,426.8	7607.7	7,676.0	7,792.9	7,933.6	8,034.3	8,131.7
Gross National Product	6,955.2	7,270.6	7,637.7	7,426.6	7610.5	7,669.1	7,796.1	7,919.2	8,013.6	--
Personal consumption expenditures	4,717.0	4,957.7	5,207.6	5,060.5	5189.1	5,227.4	5,308.1	5,405.7	5,432.1	5,527.7
Durable goods	579.5	608.5	634.5	625.2	638.6	634.5	638.2	658.4	644.5	665.0
Nondurable goods	1,428.4	1,475.8	1,534.7	1,522.1	1532.3	1,538.3	1,560.1	1,587.4	1,578.9	1,602.0
Food	714.5	735.1	756.1	765.8	752.2	757.4	766.6	775.5	771.4	778.7
Clothing and shoes	247.8	254.7	264.3	261.2	265.7	265.7	266.2	275.2	274.8	281.4
Services	2,709.1	2,873.4	3,038.4	2,913.2	3018.2	3,054.6	3,109.8	3,159.9	3,208.7	3,260.5
Gross private domestic investment	1,007.9	1,038.2	1,116.5	1,068.9	1105.4	1,149.2	1,151.1	1,193.6	1,242.0	1,253.6
Fixed investment	946.6	1,008.1	1,090.7	1,070.7	1082.0	1,112.0	1,119.2	1,127.5	1,160.8	1,200.6
Change in business inventories	61.2	30.1	25.9	-1.7	23.4	37.1	31.9	66.1	81.1	53.0
Net exports of goods and services	-90.9	-86.0	-94.8	-86.3	-93.8	-114.0	-88.6	-98.8	-88.7	-107.3
Government consumption expenditures and gross investment	1,313.0	1,355.5	1,406.7	1,383.7	1407.0	1,413.5	1,422.3	1,433.1	1,449.0	1,457.8
	Billions of 1992 dollars (quarterly data seasonally adjusted at annual rates) [1]									
Gross Domestic Product	6,610.7	6,742.1	6,928.4	6,813.8	6926.0	6,943.8	7,017.4	7,101.6	7,159.6	7,221.8
Gross National Product	6,619.1	6,748.7	6,932.0	6,814.4	6930.1	6,940.2	7,023.1	7,091.8	7,144.4	--
Personal consumption expenditures	4,486.0	4,595.3	4,714.1	4,649.1	4712.2	4,718.2	4,756.4	4,818.1	4,829.4	4,897.1
Durable goods	561.2	583.6	611.1	599.2	614.8	611.9	617.1	637.8	629.0	653.8
Nondurable goods	1,389.9	1,412.6	1,432.3	1,436.1	1431.6	1,433.9	1,441.2	1,457.8	1,450.0	1,466.8
Food	687.9	690.5	689.7	709.2	690.3	687.3	689.0	694.6	688.2	689.0
Clothing and shoes	247.1	257.5	267.7	262.5	268.4	270.8	270.0	277.1	273.8	282.3
Services	2,535.5	2,599.6	2,671.0	2,614.7	2666.5	2,672.8	2,698.2	2,723.9	2,749.8	2,777.8
Gross private domestic investment	975.7	991.5	1,069.1	1,011.4	1059.2	1,100.3	1,104.8	1,149.2	1,197.1	1,208.4
Fixed investment	915.5	962.1	1,041.7	1,013.3	1035.7	1,060.9	1,068.7	1,079.0	1,111.4	1,148.6
Change in business inventories	60.6	27.3	25.0	-3.5	21.3	37.9	32.9	63.7	77.6	51.5
Net exports of goods and services	104.6	-98.8	-114.4	-104.0	-112.6	-138.9	-105.6	-126.3	-136.6	-160.0
Government consumption expenditures and gross investment	1,252.3	1,251.9	1,257.9	1,254.7	1265.1	1,261.5	1,261.8	1,260.5	1,270.1	1,273.3
GDP implicit price deflator (% change)	2.4	2.5	2.3	2.2	1.7	2.6	1.9	2.4	1.8	1.4
Disposable personal income ($ bil.)	5,052.7	5,355.7	5,608.3	5,479.6	5573.5	5,644.6	5,695.8	5,790.5	5,849.9	5,912.4
Disposable per. income (1992 $ bil.)	4,805.1	4,964.2	5,076.9	5,034.0	5061.3	5,094.8	5,103.8	5,161.1	5,200.9	5,237.9
Per capita disposable pers. income ($)	19,381.0	20,349.0	21,117.0	20,712	21012	21,229.0	21,373.0	21,689.0	21,865.0	22,047.0
Per capita disp. pers. income (1992 $)	18,431.0	18,861.0	19,116.0	19,028	19081	19,161.0	19,152.0	19,331.0	19,439.0	19,532.0
U.S. resident population plus Armed Forces overseas (mil.)[2]	260.7	263.2	265.6	264.6	265.2	265.8	266.4	266.9	267.4	268.1
Civilian population (mil.)[2]	259.0	261.5	264.0	263.0	263.6	264.2	264.9	265.4	265.9	266.5
		Annual		1996			1997			
	1995	1996	1997	Sep	Apr	May	Jun	Jul	Aug	Sep
	Monthly data seasonally adjusted									
Total industrial production (1987=100)	109.4	113.2	116.3	117.4	120.9	121.0	121.6	122.7	123.6	124.2
Leading economic indicators (1987=100)	101.4	101.9	102.1	102.5	103.5	103.7	103.8	104.1	104.3	104.5
Civilian employment (mil. persons)[3]	123.1	124.9	126.7	127.2	129.4	129.6	129.4	129.7	129.8	129.7
Civilian unemployment rate (%)[3]	6.1	5.6	5.4	5.2	4.9	4.8	5.0	4.8	4.9	4.9
Personal income ($ bil. annual rate)	5,791.8	6,150.8	6,495.2	6,582.0	6,801.0	6,822.8	6,863.5	6,873.8	6,915.0	6,940.5
Money stock-M2 (daily avg.) ($ bil.)[4]	3,502.1	3,655.0	3,819.3	3,769.7	3,905.0	3,904.7	3,894.4	3,905.0	3,939.9	3,959.1
Three-month Treasury bill rate (%)	4.29	5.51	5.02	5.15	5.17	5.13	4.92	5.07	5.13	4.97
AAA corporate bond yield (Moody's) (%)	7.97	7.59	7.37	7.66	7.73	7.58	7.41	7.14	7.22	7.15
Total housing starts (1,000)[5]	1,457.0	1,354.1	1,476.8	1,470	1,483	1,402	1,503	1,465	1,390	1,500
Business inventory/sales ratio[6]	1.41	1.42	1.39	1.38	1.36	1.37	1.37	1.36	1.37	--
Sales of all retail stores ($ bil.)[7]	2,241.3	2,346.3	2,465.1	204.9	209.9	209.4	210.9	213.5	214.4	214.1
Nondurable goods stores ($ bil.)	1,353.4	1,405.6	1,457.8	121.8	124.5	124.6	125.2	126.3	126.4	126.8
Food stores ($bil.)	405.6	408.4	424.2	35.6	35.8	354.8	35.6	36.0	36.0	36.3
Apparel and accessory stores ($ bil.)	107.8	109.5	113.0	9.6	9.5	9.6	9.8	9.9	10.0	9.8
Eating and drinking places ($ bil.)	224.8	239.9	238.4	19.7	20.2	20.2	20.3	20.4	20.4	20.7

P = Preliminary. R = Revised. -- = Not available. 1. In April 1996, 1992 dollars replaced 1987 dollars. 2. Population estimates based on 1990 census.
3. Data beginning January 1994 are not directly comparable with data for earlier periods because of a major redesign of the household survey questionnaire.
4. Annual data as of December of the year listed. 5. Private, including farm. 6. Manufacturing and trade. 7. Annual total.
Information contact: David Johnson (202) 694-5324

Table 3—World Economic Growth

	Calendar Year									
	1989	1990	1991	1992	1993	1994	1995	1996 E	1997 F	1998 F
	Real GDP, annual percent change									
World	3.6	2.4	1.8	1.7	1.2	2.4	2.2	3.0	3.1	2.9
World, less U.S.	3.6	2.9	2.8	1.3	0.8	2.0	2.3	3.0	2.8	3.1
Developed	3.7	2.6	1.8	1.6	0.7	2.4	1.8	2.5	2.7	2.4
Developed, less U.S.	3.8	3.4	3.3	1.1	-0.1	1.8	1.7	2.3	2.0	2.4
U.S.	3.4	1.3	-1.0	2.7	2.2	3.5	2.0	2.8	3.8	2.5
Canada	2.4	-0.3	-1.8	0.8	2.3	4.6	2.2	1.5	3.6	2.8
Japan	4.9	5.1	4.0	1.0	0.1	0.4	0.9	3.7	1.0	1.6
European Union	3.5	3.0	3.6	1.1	-0.6	2.1	1.9	1.6	2.4	2.7
Germany	3.6	5.7	13.2	2.2	-1.1	0.0	0.0	1.5	2.3	2.8
Central Europe	-0.6	-6.3	-10.6	-3.8	0.5	3.4	5.3	2.8	1.8	3.5
Former Soviet Union	2.1	-3.7	-5.7	-13.6	-9.7	-14.7	-5.4	-5.6	0.1	2.1
Russia	1.9	-3.6	-5.0	-14.5	-8.7	-12.6	-4.0	-5.0	0.7	2.4
Developing	3.8	3.5	4.0	5.2	5.1	4.7	4.7	5.6	5.2	4.8
Asia	6.1	6.1	6.0	8.1	7.9	8.8	8.3	7.5	6.3	5.8
Pacific-Asia	6.2	6.4	8.1	9.2	9.5	9.9	9.1	7.9	6.5	5.8
China	4.1	3.7	9.5	14.6	13.9	13.0	10.7	9.7	9.0	8.5
South Asia	6.1	5.6	1.2	5.4	3.8	5.9	5.8	6.4	6.0	5.8
India	6.6	5.6	0.5	5.3	4.0	6.3	6.1	6.7	6.1	5.9
Latin America	1.0	-0.1	3.4	2.8	3.6	1.2	0.0	3.3	4.3	4.0
Mexico	3.4	4.5	3.6	2.9	0.7	3.6	-7.2	5.1	5.7	5.0
Caribbean/Central	4.6	1.0	2.4	4.2	3.7	2.4	2.8	3.0	3.0	3.1
South America	-0.1	-1.4	3.5	2.6	4.4	5.4	1.8	2.9	4.1	3.8
Brazil	3.3	-4.6	0.5	-1.2	4.5	5.8	3.0	2.9	3.0	3.1
Middle East	3.4	4.8	2.6	5.3	4.7	0.7	3.4	4.6	4.0	3.6
Africa	3.3	1.5	0.8	0.5	-0.7	1.9	2.2	3.8	3.3	3.2
North Africa	3.3	2.2	1.6	0.8	-0.5	2.1	1.8	4.7	4.0	3.8
Sub-Sahara	3.2	1.1	0.3	0.2	-0.8	1.7	2.4	3.2	2.9	2.8

E = Estimate. F = Forecast.
Information contact: Alberto Jerardo (202) 219-0645

Farm Prices

Table 4—Indexes of Prices Received & Paid by Farmers, U.S. Average

	Annual			1996	1997					
	1994	1995	1996	Oct	May	Jun	Jul	Aug	Sep R	Oct P
	1990-92=100									
Prices received										
All farm products	100	102	112	112	108	108	107	108	107	108
All crops	105	112	126	119	117	119	114	117	114	116
Food grains	119	134	157	140	139	120	111	122	126	123
Feed grains and hay	106	112	146	125	124	119	113	115	114	116
Cotton	109	127	122	118	112	110	111	111	115	114
Tobacco	101	103	105	110	--	--	91	92	101	103
Oil-bearing crops	110	104	128	118	149	145	134	128	111	115
Fruit and nuts, all	90	99	118	139	103	124	125	128	135	129
Commercial vegetables	109	120	111	107	109	116	111	125	117	139
Potatoes and dry beans	110	107	114	91	94	94	111	110	88	84
Livestock and products	95	92	99	103	100	98	100	99	99	95
Meat animals	90	85	87	91	97	94	95	94	92	88
Dairy products	99	98	114	126	100	95	93	97	101	104
Poultry and eggs	106	107	120	121	111	111	119	118	116	108
Prices paid										
Commodities and services										
Interest, taxes, and wage rates	106	110	115	115	117	117	116	116	116	117
Production items	106	109	115	115	117	117	116	116	116	117
Feed	105	104	130	124	129	124	119	118	121	125
Livestock and poultry	94	82	75	79	95	95	100	97	96	94
Seeds	108	110	115	117	120	120	120	120	120	120
Fertilizer	105	120	124	122	124	122	121	119	119	119
Agricultural chemicals	112	115	119	121	121	121	120	121	121	121
Fuels	95	94	105	114	101	98	95	100	101	103
Supplies and repairs	109	112	115	115	117	117	118	118	118	118
Autos and trucks	107	107	108	108	109	109	109	108	108	108
Farm machinery	113	120	125	127	127	127	127	127	127	128
Building material	109	114	115	116	118	118	118	118	118	118
Farm services	112	118	118	118	117	118	118	118	119	119
Rent	108	116	119	119	119	119	119	119	119	119
Int. payable per acre on farm real estate debt	94	101	105	105	106	106	106	106	106	106
Taxes payable per acre on farm real estate	106	109	112	112	115	115	115	115	115	115
Wage rates (seasonally adjusted)	110	114	117	120	123	123	119	119	119	119
Production items, interest, taxes, and wage rates	105	109	114	115	117	116	116	115	116	116
Ratio, prices received to prices paid (%)*	94	93	98	97	92	92	92	93	92	92
Prices received (1910-14=100)	634	647	712	713	684	683	678	686	680	683
Prices paid, etc. (parity index) (1910-14=100)	1,397	1,437	1,504	1,510	1,539	1,532	1,525	1,522	1,527	1,533
Parity ratio (1910-14=100) (%)*	45	45	47	47	44	45	44	45	45	45

R = revised. P = preliminary. -- = not available. *Ratio of index of prices received for all farm products to index of prices paid for commodities and services, interest, taxes, and wage rates. Ratio uses the most recent prices paid index. Prices paid data are quarterly and are published in January, April, and October.
I*nformation contact*: David Johnson (202) 219-0663. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540. Internet users can access the NASS Home Page at http://www.usda.gov/nass.

Table 5—Prices Received by Farmers, U.S. Average

	Annual[1]		1996		1997					
	1994	1995	1996	Oct	May	Jun	Jul	Aug	Sep R	Oct P
Crops										
All wheat ($/bu.)	3.45	4.55	4.30	4.17	4.09	3.52	3.23	3.56	3.67	3.55
Rice, rough ($/cwt)	6.78	9.15	9.50	9.75	10.10	9.88	10.00	9.94	9.85	9.83
Corn ($/bu.)	2.26	3.24	2.70	2.89	2.69	2.56	2.43	2.50	2.52	2.63
Sorghum ($/cwt)	3.80	5.69	4.20	4.37	4.17	4.10	3.95	4.09	3.99	4.20
All hay, baled ($/ton)	86.70	82.20	93.00	93.70	118.00	108.00	98.40	101.00	101.00	103.00
Soybeans ($/bu.)	5.48	6.72	6.85	6.95	8.40	8.16	7.53	7.25	6.72	6.74
Cotton, upland (cents/lb.)	72.00	75.40	70.60	71.50	68.10	66.80	67.10	67.10	69.40	69.00
Potatoes ($/cwt)	5.58	6.77	5.11	4.76	5.19	5.23	6.34	6.33	5.16	4.86
Lettuce ($/cwt)[2]	13.30	23.50	14.80	15.40	10.50	14.70	17.00	22.80	22.30	31.60
Tomatoes fresh ($/cwt)[2]	27.40	25.80	28.50	29.30	33.80	32.70	26.80	26.10	23.30	23.60
Onions ($/cwt)	9.87	9.87	9.58	11.40	13.60	15.40	14.20	14.40	10.70	9.14
Beans, dry edible ($/cwt)	22.50	20.80	24.20	23.90	22.60	21.70	22.70	20.40	16.30	16.00
Apples for fresh use (cents/lb.)	18.60	24.00	20.90	24.60	14.80	14.60	14.10	19.00	24.70	25.30
Pears for fresh use ($/ton)	223.00	272.00	375.00	505.00	501.00	583.00	310.00	330.00	360.00	334.00
Oranges, all uses ($/box)[3]	6.37	6.11	6.93	10.94	4.76	4.62	5.08	6.93	6.95	3.69
Grapefruit, all uses ($/box)[3]	5.26	4.61	4.63	5.52	-0.14	1.82	6.92	5.78	4.18	4.15
Livestock										
Cattle, all beef ($/cwt)	66.50	61.80	58.70	63.30	65.10	62.30	62.80	63.90	63.60	62.00
Calves ($/cwt)	87.10	73.10	58.40	60.10	84.30	85.40	86.90	88.00	86.90	84.70
Hogs, all ($/cwt)	39.50	40.50	51.90	55.60	58.20	57.80	58.90	55.30	50.40	47.00
Lambs ($/cwt)	64.80	78.20	88.20	87.00	90.90	86.60	81.30	92.70	90.60	--
All milk, sold to plants ($/cwt)	13.01	12.78	14.75	16.40	13.00	12.40	12.20	12.70	13.20	13.60
Milk, manuf. grade ($/cwt)	11.85	11.79	13.43	14.60	10.90	10.70	10.80	11.90	12.70	13.00
Broilers, live (cents/lb.)	35.00	34.40	38.10	39.50	36.40	37.40	40.10	40.10	38.50	35.00
Eggs, all (cents/doz.)[4]	67.25	62.40	75.00	73.60	64.30	59.70	65.70	63.50	69.60	65.80
Turkeys (cents/lb.)	40.70	41.00	43.30	45.10	41.20	41.50	41.10	40.70	41.10	40.30

P = Preliminary. R = Revised. -- = Not available. 1. Season-average price by crop year for crops. Calendar year average of monthly prices for livestock.
2. Excludes Hawaii. 3. Equivalent on-tree returns. 4. Average of all eggs sold by producers including hatching eggs and eggs sold at retail.
Information contact: David Johnson (202) 694-5324. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540. Internet users can access the NASS Home Page at http://www.usda.gov/nass

Producer & Consumer Prices

Table 6—Consumer Price Indexes for All Urban Consumers, U.S. Average (not seasonally adjusted)

	Annual		1996		1997					
	1994	1995	1996	Oct	May	Jun	Jul	Aug	Sep	Oct
					1982-84=100					
Consumer Price Index, all items	148.2	152.4	156.9	158.3	160.1	160.3	160.5	160.8	161.2	161.6
CPI, all items less food	149.0	153.1	157.5	158.8	160.7	161.0	161.1	161.3	161.8	162.2
All food	144.3	148.4	153.3	155.4	156.6	156.6	157.0	157.6	157.9	158.2
Food away from home	145.7	149.0	152.7	154.2	156.3	156.6	157.1	157.4	157.8	158.2
Food at home	144.1	148.8	154.3	156.8	157.5	157.3	157.7	158.5	158.6	159.0
Meats[1]	135.4	135.5	140.2	143.6	143.9	144.5	144.6	145.5	145.6	145.2
Beef and veal	136.0	134.9	134.5	136.0	136.9	136.4	136.5	137.0	137.2	137.1
Pork	133.9	134.8	148.2	156.0	154.3	157.4	157.5	158.6	158.9	157.4
Poultry	141.5	143.5	152.4	157.1	156.6	156.7	157.9	155.6	156.8	155.6
Fish and seafood	163.7	171.6	173.1	173.5	176.5	176.6	174.9	177.5	176.5	178.4
Eggs	114.3	120.5	142.1	142.6	133.4	128.8	132.9	137.7	136.9	135.9
Dairy Products[2]	131.7	132.8	142.1	149.3	145.4	144.1	143.3	143.4	143.5	145.7
Fats and oils[3]	133.5	137.3	140.5	141.6	142.0	141.6	141.4	141.4	142.0	141.7
Fresh fruit	201.2	219.0	234.4	243.9	239.4	228.5	229.9	237.0	243.9	242.6
Processed fruits	133.1	137.1	145.2	146.9	149.3	149.1	149.7	148.7	148.5	148.4
Fresh vegetables	172.3	193.1	189.2	180.9	187.3	189.1	190.3	192.3	189.5	192.8
Potatoes	174.3	174.7	180.6	172.5	167.3	172.4	181.9	194.0	191.7	181.6
Processed vegetables	136.6	138.3	143.9	146.1	147.3	147.6	147.9	149.1	146.8	145.9
Cereal and bakery products	163.0	167.5	174.0	175.1	176.9	178.2	178.3	178.6	178.1	178.4
Sugar and sweets	135.2	137.5	143.7	145.7	147.9	148.1	149.2	147.8	148.5	148.2
Nonalcoholic beverages	123.2	131.7	128.6	127.6	133.4	134.8	136.3	136.7	136.7	136.6
Apparel										
Apparel, commodities less footwear	131.2	129.3	128.5	130.3	132.3	129.1	126.3	125.9	129.6	131.4
Footwear	126.0	125.4	126.6	128.0	129.1	126.3	125.9	126.3	127.4	130.6
Tobacco and smoking products	220.0	225.7	232.8	235.3	243.8	241.3	242.0	243.4	246.5	250.2
Alcoholic beverages	151.5	153.9	158.5	160.1	162.8	162.7	162.9	163.2	163.5	163.7

1. Beef, veal, lamb, pork, and processed meat. 2. Includes butter. 3. Excludes butter.
Information contact: David Johnson (202) 219-0663. For historical data or for categories not listed here, call the Bureau of Labor Statistics' CPI Information Hotline at (202) 606-7828.

Table 7—Producer Price Indexes, U.S. Average (not seasonally adjusted)

	Annual			1995	1996					
	1994	1995	1996	Sep	Apr	May R	Jun	Jul	Aug	Sep P
					1982=100					
All commodities	120.4	124.8	127.7	128.2	127.0	127.4	127.2	126.9	127.2	127.5
Finished goods[1]	125.5	127.9	131.3	131.8	131.6	131.6	131.6	131.3	131.7	131.8
All foods[2]	125.2	126.7	132.5	135.0	132.5	133.5	131.8	131.6	132.6	132.7
Consumer foods	126.8	129.0	133.6	135.6	134.3	135.2	134.0	134.0	134.8	134.8
Fresh fruits and melons	82.6	85.7	100.8	119.5	102.2	110.8	91.1	82.3	81.1	92.2
Fresh and dry vegetables	129.1	144.4	135.0	106.4	111.2	111.3	108.8	112.1	131.7	125.0
Dried fruits	121.1	121.2	124.2	124.3	125.7	125.7	125.7	125.7	125.7	125.7
Canned fruits and juices	126.0	129.4	137.5	138.8	139.5	139.1	137.1	137.5	137.3	136.1
Frozen fruits, juices and ades	111.9	115.9	123.9	126.1	120.1	120.1	120.0	120.9	117.1	114.9
Fresh veg. except potatoes	117.8	139.8	120.9	91.3	109.6	103.2	112.2	115.7	125.2	121.8
Canned vegetables and juices	116.3	116.6	121.2	121.9	120.1	119.8	119.6	119.3	119.7	119.5
Frozen vegetables	126.0	124.2	125.4	126.0	125.6	125.7	125.7	126.7	125.7	125.9
Potatoes	142.3	142.6	133.9	111.7	78.3	76.0	96.1	106.9	159.0	148.3
Eggs for fresh use (1991=100)	80.9	86.3	105.1	107.7	87.6	86.9	79.4	96.6	88.0	100.1
Bakery products	160.0	164.3	169.8	171.3	173.4	173.8	173.5	173.9	173.9	127.5
Meats	104.6	102.9	109.0	112.2	112.4	115.7	113.0	113.1	115.5	112.5
Beef and veal	103.6	100.9	100.2	103.6	103.1	105.3	102.1	100.9	104.7	103.8
Pork	101.3	101.4	120.9	125.5	124.6	132.2	128.7	130.9	131.9	123.2
Processed poultry	114.8	114.3	119.8	123.6	117.3	117.1	117.4	118.5	119.7	119.0
Unprocessed and packaged fish	161.5	170.9	165.9	157.4	175.4	180.9	173.1	168.7	166.3	169.5
Dairy products	119.5	119.7	130.4	139.7	127.8	125.9	125.3	124.5	126.0	127.4
Processed fruits and vegetables	121.2	122.4	127.6	128.6	127.2	126.9	126.3	126.6	126.0	125.4
Shortening and cooking oil	138.6	142.5	138.5	140.6	137.2	138.0	136.6	141.4	138.6	136.6
Soft drinks	126.9	133.1	134.0	134.2	133.7	133.5	133.4	133.2	133.0	132.7
Finished consumer goods less foods	121.6	123.9	127.6	128.0	127.7	127.6	128.2	127.7	128.1	128.5
Alcoholic beverages	124.8	128.5	132.8	132.0	135.8	136.1	135.8	135.4	135.5	134.2
Apparel	123.5	124.2	125.1	125.3	125.3	125.5	125.4	125.7	125.6	125.6
Footwear	135.5	139.2	141.6	142.0	143.5	143.7	143.8	143.9	144.5	145.6
Tobacco products	224.7	231.3	237.4	238.2	247.2	248.3	248.5	248.4	247.8	255.7
Intermediate materials[3]	118.5	124.9	125.8	126.7	125.3	125.4	125.7	125.5	125.6	126.0
Materials for food manufacturing	118.5	119.5	125.3	129.2	123.8	123.9	122.8	122.3	122.8	123.2
Flour	110.3	122.8	136.8	125.3	124.5	123.4	120.2	114.2	115.4	117.8
Refined sugar[4]	118.3	119.4	123.7	125.5	125.3	125.4	124.5	120.9	122.2	123.6
Crude vegetable oils	135.0	129.8	118.1	120.4	114.0	117.4	115.8	114.3	110.6	112.5
Crude materials[5]	101.7	102.7	113.8	112.9	107.9	110.4	107.2	107.2	107.8	108.2
Foodstuffs and feedstuffs	106.5	105.8	121.5	124.9	116.7	117.4	111.5	112.1	111.7	111.1
Fruits and vegetables and nuts[6]	104.6	108.4	122.5	122.4	112.5	117.5	105.0	101.2	108.2	112.0
Grains	102.7	112.6	151.1	138.7	121.2	116.6	112.4	105.9	106.3	107.2
Slaughter livestock	96.4	92.8	95.2	100.5	101.6	102.6	96.2	98.8	97.9	95.8
Slaughter poultry, live	124.4	125.6	140.5	147.4	127.0	130.9	133.4	146.9	147.9	139.9
Plant and animal fibers	120.7	155.3	129.4	122.8	115.1	116.0	117.5	120.0	121.1	118.3
Fluid milk	95.8	93.7	107.9	119.6	97.6	95.6	93.2	90.7	93.7	95.3
Oilseeds	117.4	112.6	139.4	151.9	151.7	159.1	149.8	146.6	133.9	130.2
Leaf tobacco	101.2	78.9	89.4	110.5	--	--	--	--	92.0	101.4
Raw cane sugar	115.2	119.7	118.6	119.4	116.2	115.9	115.8	117.6	118.6	118.3

-- = Not available. R = Revised. 1. Commodities ready for sale to ultimate consumer. 2. Includes all raw, intermediate, and processed foods (excludes soft drinks, alcoholic beverages, and manufactured animal feeds). 3. Commodities requiring further processing to become finished goods. 4. All types and sizes of refined sugar. 5. Products entering market for the first time that have not been manufactured at that point. 6. Fresh and dried.
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