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.

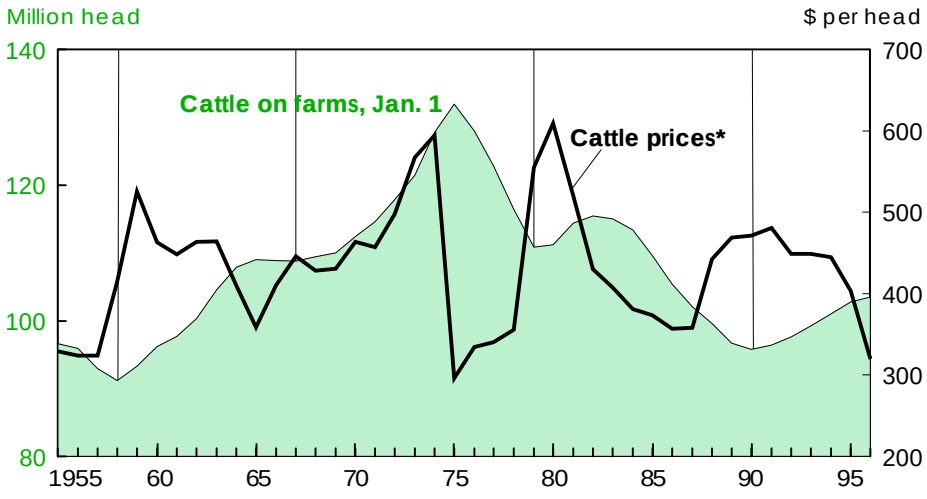
Supplies of feeder cattle outside feedlots and available for placements this fall and in 1998 are already beginning to tighten—supplies on October 1 were down 7 percent from a year earlier, and feedlot placements in October were down 4 percent from a year earlier. Feeder cattle supplies will continue 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.

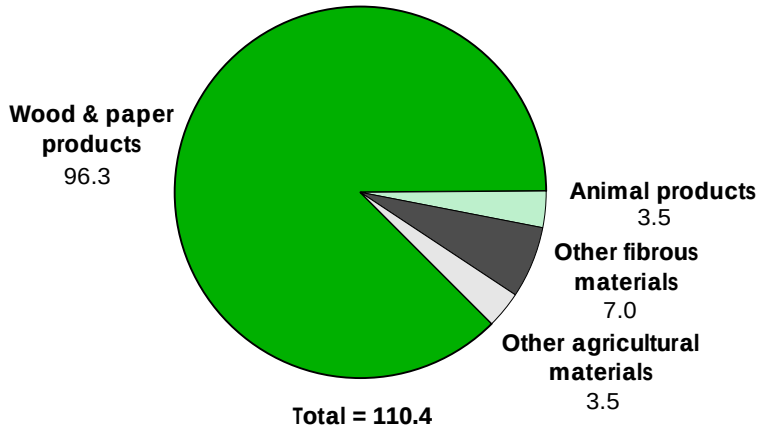
The *partially agriculturally derived* category includes three types of materials or chemicals: those that are partially derived from agricultural sources, those that are agriculturally based but are included by the Census in an aggregated group containing both agriculturally based and nonagriculturally 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.