



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

AEO (pd)

Staff Contribution 1-63

WITHDRAWN
GIANNINI FOUNDATION OF
AGRICULTURAL ECONOMICS
LIBRARY

FEB 21 1961

Miscellaneous Staff Contribution
of the
Department of Agricultural Economics

Purdue University *Sch. of agric.*
Lafayette, Indiana

**For information concerning additional available publica-
tions write: Librarian, Department of Agricultural Economics**

1-63

THE LONG-TIME OUTLOOK FOR CORN BELT AGRICULTURE

Prepared by

J. Carroll Bottum, R. H. Bauman, J. O. Dunbar,
N. S. Hadley, L. S. Hardin and J. B. Kohlmeyer,
Purdue University, May, 1960

Present indications point to an increasing domestic demand for our livestock products during the next several years. Nevertheless, if no changes are made in governmental programs and if livestock cyclical patterns follow their normal course, livestock marketings during the 1961-63 period are likely to be so large that they will create a difficult price and income situation for producers. This situation is being pointed out so that individual producers may keep it in mind in making adjustments, and, in order that citizens are aware of it as they think through and possibly modify governmental farm programs. To the extent that individual adjustments are made which are not normal, and to the extent that governmental farm policies are modified from those presently in force, the situation will be changed from the one here discussed.

Farm Income Down in 1959

The realized net income of U. S. farm operators was \$11.0 billion in 1959, compared with \$13.1 billion in 1958 and \$11.0 billion in 1957. The \$11.0 billion income for 1959 represented a 16 percent decline from the year before. For corn belt farmers the income decline in 1959 was substantially greater than for the U. S.

The net farm income on 214 central Indiana farms was \$5,272 in 1959 - down \$6,815 or 56 percent from \$12,087 in 1958. Major reason for this sharp decline was the sharp drop in the Indiana farm price of hogs which averaged \$20.27 for 1958 and \$14.36 in 1959. Also, in 1959 the average Indiana farm price of corn decreased 3 cents per bushel from \$1.11 to \$1.08.

This 56 percent decrease in net farm income on this group of central Indiana farms appears to be fairly representative of what occurred generally throughout the corn belt, (Table 1).

Net farm income on 165 farms in two southern Michigan areas as reported by the Michigan State University dropped from \$8,042 in 1958 to \$4,485 in 1959. This drop of \$3,557 amounted to 45 percent.

Net farm income on a group of Ohio farms as reported by Ohio State University dropped from \$5,659 in 1958 to \$3,731 in 1959 or approximately one-third.

Capital and management earnings on 50 central Illinois cash grain farms as reported by the University of Illinois dropped from \$9,223 in 1958 to \$4,236 in 1959 - approximately \$5,000 or 54 percent.

Net farm income on 324 farms in eastern Kansas as reported by Kansas State University dropped from \$5,833 in 1958 to \$4,071 in 1959 - approximately 30 percent.

Farm Earnings - Next Several Years

Because of reduced hog marketings in prospect during 1960 and early 1961 resulting from reduced farrowings, the 1960 income of corn belt farmers during this period should be somewhat better than for 1959. However, in the longer run hog and other livestock prices will depend upon the price of feed grains. Cheap feed means cheap livestock prices. Present price support legislation would indicate the longer-time price of corn, approximately \$1 per bushel, hogs about \$14 per hundred and other livestock prices in competitive relationship to the price of corn and hogs.

To approximate the effect of various levels of hog prices on the income of Indiana hog farmers under the present price structure, the extension farm account records for 105 hog farms for the three-year period 1955-57 were analyzed. These

Table 1. Average Earnings of Central Indiana Farms, 1950 to 1959^{1/}

	1955	1956	1957	1958	4-year average	1959*
Number of farms	286	273	279	290	282	214
Avg. size of farm (acres)	270	280	292	299	279	308
Avg. capital investment	\$90,427	\$94,572	\$103,928	\$110,036	\$99,741	\$116,310
Gross cash receipts	\$25,430	\$26,786	\$32,366	\$36,346	\$30,232	\$31,561
Total cash expenses	\$18,246	\$18,551	\$23,632	\$27,791	\$22,110	\$25,532
Net cash income	\$7,184	\$8,235	\$8,734	\$8,627	\$8,122	\$6,029
<u>Net farm income</u> ^{2/}	\$3,352	\$10,462	\$9,957	\$12,087	\$8,962	\$5,272
Return to labor and management ^{3/}	\$-1,169	\$5,733	\$4,761	\$6,585	\$3,978	\$-543
Rate earned on invest- ment (%) ^{4/}	-0.5	6.2	5.2	6.5	4.3	0.4
Prices: Corn	\$ 1.24	\$ 1.28	\$ 1.14	\$ 1.11	\$ 1.19	\$ 1.08
Hogs	\$ 15.72	\$ 14.58	\$ 18.02	\$ 20.27	\$ 17.15	\$ 14.36

*Preliminary.

^{1/} These farms are much above average in size, capital investment, management and earnings.

^{2/} Net Farm Income: Net cash income, plus (or minus) inventory changes, minus value of unpaid family labor. This is return to labor, management and capital. On rented farms it must be divided between the landowner and the operator.

^{3/} Labor Income: Return for labor and management of the owner-operator, or to the owner and operator on a rented farm. This does not include the value of items of family living furnished by the farm. It is "net farm income" minus an arbitrary interest charge of 5 percent on the total capital invested.

^{4/} Rate Earned on Investment: This represents what the farm business earned after all expenses were paid including wages for the operator at the rate of \$217 per month plus management for both operator and landlord at 8 percent of their respective share of the value of farm production. It is "net farm income" minus the wage and management charges for the operator and the management charge for the landlord, divided by the total capital invested.

farms averaged 269 acres in size, produced 46 spring litters, 24 fall litters and obtained two-thirds of their cash receipts from the sale of hogs. Average total investment per farm was \$90,000.

During the 1955-57 three-year period, the average Indiana farm price of hogs was \$16.05 per cwt. Corn was \$1.22 per bushel and the Indiana hog-corn ratio was 13.3 compared with the 13.6 long-time average. Net cash income per farm was \$7500. Labor income was \$2900 and the rate earned on investment, 4.7 percent.

Table 2. Net Cash Income* for 105 Indiana Hog Farms for 1955-57 and Estimated Income with Varying Hog Prices

Size of farm--acres	246
Investment per farm--dollars	90,000
Actual net cash income--1955-57	7,500
Net cash income with:	
\$10.00 hogs--dollars	1,000
\$12.00 hogs--dollars	3,150
\$14.00 hogs--dollars	5,300
\$16.00 hogs--dollars	7,500
\$18.00 hogs--dollars	9,700

*Net cash income is the amount left over for capital and for the labor and management of the operator and his family.

The income figures shown in Table 3 assume purchased feed prices 10 percent below 1955-57 levels, crops sold 20 percent less (about \$1.00 for corn instead of \$1.22), crop yields at 1955-57 levels and that the increases in farm production costs other than feed will be roughly offset by increases in farm production efficiency.

Thus with corn at \$1.00 per bushel and hogs at \$14 (approximate long-time Indiana hog-corn ratio of 13.6), the net cash income of \$7500, which was the 1955-57 average for these farms, would drop to \$5300, a reduction of \$2200.

Feed-Grain Supplies Large

Total feed-grain production in 1959 reached an all time record high exceeding the 1958 previous record by about five percent. This has resulted in large current storage stocks and lower government support levels. Total Commodity Credit holdings were around \$9 billion on January 31, 1960, as compared to about \$7 billion at the low point in 1958. Currently more than 75 percent of these investments in inventories and loans is in the four grain crops--wheat, corn, grain sorghums and barley.

The discontinuance of the acreage reserve and corn control program and the continuation of only a limited conservation reserve program have resulted in an increase in acres in planted crops, (Table 3). The increase in corn from 74.6 million planted acres in 1958 to a planted acreage of 85.5 million in 1959 represents one of the most significant changes, (Table 1). The indicated acreage for 1960 is up slightly over 1959.

Table 3. United States Planted Acreages of Crops

Crop	Average	1958	1959	Indicated
	1948-57			1960
Acres ('000' omitted)				
Corn, all	81,765	74,654	85,530	85,758
Spring wheat	18,603	12,343	13,431	12,817
Winter wheat	51,489	44,088	44,612	44,389
Oats	44,028	38,430	36,141	34,273
Barley	12,924	16,268	16,990	16,386
Flaxseed	4,969	4,014	3,482	3,469
Rice	1,906	1,444	1,607	1,611
Sorghums for all purposes	17,484	21,176	19,886	19,800
Soybeans	16,822	24,900	23,178	24,667
Hay*	74,081	73,033	69,404	69,088

*Acreage harvested.

Assuming average weather and a continued yearly increase in yields of about three-quarters of a bushel per acre, yields per acre for the next year (1960)

will be about 50 bushels. This yield, with the acreage indicated on March 1, would result in a 1960 production of about 4.2 billion bushels of corn. Such production would result in more corn than would be used annually even with our expanded livestock numbers, (Table 4). Therefore, it appears that the level of corn prices will continue to be determined by support activities.

Table 4. Corn Supplies, Disappearance and Prices

		1956	1957	1958	1959	1960 ^{1/}
Stock beginning of year (Oct. 1)	Bil. bu.	1.2	1.4	1.5	1.5	2.0
<u>Production:</u>						
Acres	Mil. acres	76	73	73	85	85
Yield	Bu./acre	46	47	52	52	50
Production	Bil. bu.	3.5	3.4	3.8	4.4	4.2
Total supply	Bil. bu.	4.6	4.8	5.3	5.9	6.2
Disappearance	Bil. bu.	3.2	3.4	3.7	3.9	3.9
Stocks end of year (Sept. 30)	Bil. bu.	1.4	1.5	1.5	2.0	2.3
Under price support	Bil. bu.	1.3	1.4	1.4	1.8	2.0
<u>Percent of production:</u>						
Percent of commercial acreage in compliance (%)		24	14	12	100	100
<u>Price support:</u>						
Complying farms	Per bu.	1.50	1.40	1.36	1.12	1.06
Non-complying farms	Per bu.	1.25	1.10	1.06		
Average national farm price of corn marketing year, Oct.-Sept.	Per bu.	1.21	1.07	1.08	1.02 ^{1/}	.95

^{1/} Estimated.

This analysis assumes that prospective grain prices will not noticeably reduce production of total grains in the next two or three years. Farmers shift from one crop to another rather quickly in response to changes in price relationships. However, the reduction of TOTAL crop production, as a result of lower prices, is much slower. Any significant downward adjustment in total grain production usually depends partly upon the withdrawal of land from crops.

Farm Price of Corn Likely to be Below Support

The level of corn supports for 1959 was \$1.12. The 1960 support price has been announced at around \$1.06. By 1961, the level will be slightly lower. The

amount which the farm price of corn hangs below the loan rate is affected by several factors, chiefly: (1) the size and quality of the corn crop, (2) supplies and prices of other feeds, and (3) the numbers of grain consuming livestock in relation to feed supplies. Experience before World War II and in the early '50's when a large percentage of commercial corn was under loan, indicates about 10-15 cents as the probable spread between support price and farm price as an annual average.

Thus with average weather and present government programs, we can expect corn prices of around \$1 per bushel to slightly less for the next two or three years. Such prices would likely result in the expansion of livestock numbers to the point where normal livestock feeding ratios are established.

Hog Numbers Increasing

Hog numbers declined cyclically in 1956 and 1957 (Table 5) and reached their cyclical low point in early 1958. Between January 1, 1958, and January 1, 1959, hog numbers increased from about 51 million head to 57 million head. Low prices in 1959 resulted in reduced breeding for the 1960 spring pig crop. However, reports of prospective reduced farrowings have stimulated the demand for breeding stocks to such a degree that farrowings in the fall of 1960 are likely to be nearly as large as in 1959. Hence, any price improvement enjoyed in 1960 is likely to be of short duration.

During the past 40 years, the Indiana corn-hog ratio has averaged a little less than 14 to 1. If we assume \$1 corn for the next several years, this is likely to result in hogs near the \$14 level for the average of the period. During the last 40 years, the ratio has never gotten more favorable than 18 to 1 for any length of time nor less favorable than 10 to 1 for any length of time. Thus \$1 corn would likely result in hogs fluctuating between \$10 and \$18 per hundred weight and averaging around the \$14 level.

Table 5. Number on Farms and Value per Head of Cattle and Hogs in the United States, January 1, 1960-60

Year	Number on farms			Value per head		
	Milk cows			Milk cows		
	Cattle	2 yrs. & older	Hogs	Cattle	2 yrs. & older	Hogs
	1000	1000	1000	(Dol.)	(Dol.)	(Dol.)
	head	head	head			
1950	77,963	23,853	58,937	124.00	177.00	27.10
1951	82,083	23,568	62,269	160.00	219.00	33.30
1952	88,072	23,060	62,117	179.00	252.00	29.90
1953	94,241	23,549	51,755	128.00	203.00	26.10
1954	95,679	23,896	45,114	92.00	147.00	36.60
1955	96,592	23,462	50,474	88.20	134.00	30.60
1956	96,804	23,213	55,173	88.00	139.00	17.70
1957	94,502	22,916	51,703	91.60	147.00	24.70
1958	93,350	22,233	50,980	119.00	176.00	30.20
1959	96,650	21,488	56,924	153.00	219.00	32.00
1960	101,520	21,331	58,464	136.00	208.00	18.50

Beef Cattle Liquidation Probable in Early '60's

Cattle numbers reached their previous cyclical peak January 1, 1956. They declined during 1956 and 1957, making the shortest cyclical liquidation in history. At the beginning of 1958, cattle numbers turned upward, and apparently we have entered into the expansion phase of another cycle. Cattle numbers increased more than 8 million head in the last two years--over 3 million in 1958 and almost 5 million in 1959. The price break came in the last cattle cycle three and one-half years after the expansion in numbers started. If this cycle should follow a similar pattern, it would make the price break for cattle in 1961. However, adverse weather and feed conditions could cause liquidation to start earlier. With the last two years of build-up in cattle numbers, we are over 100 million head for the first time in history exceeding the previous 1956 record high by almost 5 million head. When we are building up cattle numbers, it means we have two buyers, particularly for cows and heifers--the slaughterer and the producer. Eventually, numbers build up to where there are increases in marketings for slaughter. Prices then weaken. The increased slaughter and

weakening of prices are then followed by the producers withdrawing from the market and the total annual production going for slaughter. With the weakened prices resulting from the total production going for slaughter, the next phase is generally some liquidation.

During the expansion phase, which is now taking place, cow and calf marketings for slaughter are reduced relative to steers. This makes the prices for cows and calves high relative to steers--as they now are. During 1958, slaughter of cows and calves was nearly 25 percent below 1957. And in 1959 it was about 35 percent below 1957.

When we turn from the accumulating phase of cattle numbers to the liquidation, we get rather sharp adjustments in prices. For example, the United States prices of cattle dropped from \$179 per head on January 1, 1952, to \$92 per head on January 1, 1954, (Table 5). On the other hand, prices rose from \$91.60 per head on January 1, 1957, to \$153 per head on January 1, 1959. Marketings and prices change much more than do total cattle numbers on farms and ranches.

Per Capita Consumption of Beef Increasing

There are a number of factors contributing to the increased consumption per capita of beef, most important is the rising per capita income. We have known for a long time that as the per capita income rises, people tend to eat more beef. This has been particularly well demonstrated since World War II. Nevertheless, even with an expanding market, one may have depressed prices when supplies become excessive.

The trend in dairy cow numbers since 1950 has been slightly downward with a reduction of over 600,000 head shown for 1958. Thus the changes in total cattle marketings have resulted from fluctuations in beef cattle numbers almost entirely. Beef cattle marketings are likewise continuing to represent a larger share of total cattle marketings.

Present Build-up of Livestock Numbers Cause for Concern

Large storage holdings of feed plus large feed and livestock production during the period ahead appear likely. This, coupled with the likelihood that the cattle cycle will reach the liquidation phase during this period, makes it a period of serious concern to livestock producers.

The ability of the livestock-feed economy to act as a safety valve for excess farm production has very definite limits which we now appear to be approaching. The experience of 1955-56 made clear that once a certain supply level is reached, the demand for cattle and hogs is not unlimited. It appears that even with high and increasing consumer incomes, the price structure to producers is endangered whenever the supply of red meats for consumption is much in excess of 160 to 165 pounds per capita.