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Purdue Agricultural Economics Report

A QUARTERLY PUBLICATION OF THE AGRICULTURAL ECONOMICS FACULTY
 EDITOR: CHRIS HURT
 EDITORIAL BOARD: STEPHEN B. LOVEJOY AND JOE UHL
 AGRICULTURAL ECONOMICS DEPARTMENT • PURDUE UNIVERSITY

Land Values Increase, But at Slower Pace

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Indiana cropland values peaked in 1981, according to the Purdue Land Values Survey, and by 1987 had declined by about 55 percent. The statewide estimate for the value of top land was about \$2700 in 1981 and \$1200 in 1987. Average quality land also peaked in 1981 at \$2100 per acre and bottomed at \$913 in 1987. Every year since then, land values have increased; however, the 6 percent increase the past year was only about half the increase from 1988 to 1989. Since 1987, Indiana land values have increased by about a third, according to the Purdue study.

Statewide Land Prices

The survey showed statewide average increases for the six months ending in June 1990 of 3.5 percent on top land, 3.8 percent on average land, and 3.0 percent on poor land

(Table 1). These increases are less than were reported for the same period a year ago. Sixty-four percent of the respondents reported that most classes of land increased during the 6 month period, under 2 percent reported declines and about 34 percent felt there was no change in land values. Last year, a slightly higher percentage of the respondents indicated increases in land values and 30 percent thought they had been stable.

The statewide increase in value for the year ending in June 1990 was 4.7 percent on top land, 6 percent on average land, and 5.3 percent on poor land (Table 2). These increases are only about half the annual increases of the past two years.

Statewide, land with an estimated long term corn yield of 140 bushels per acre had an average estimated value of \$1589 per acre (Table 1) or \$11.35 per bushel (Table 3).

Table 1. Average estimated land value per acre (tillable, bare land) and percentage change by geographic area and land class, selected time periods, Purdue Land Values Survey, Indiana, July 1990.

Area	Class	Corn bu/A	Dec. 1989 \$	June 1990 \$	Change 12/89-6/90 %	Projected	
						Dec. 1990 \$	Change 6/90-12/90 %
North	Top	140	1515	1581	4.4	1610	1.8
	Average	111	1112	1173	5.5	1195	1.9
	Poor	85	765	796	4.1	806	1.3
Northeast	Top	137	1500	1543	2.9	1566	1.5
	Average	110	1086	1116	2.8	1111	-0.4
	Poor	85	733	748	2.0	761	1.7
W. Central	Top	143	1568	1642	4.7	1686	2.7
	Average	119	1281	1337	4.4	1366	2.2
	Poor	93	919	953	3.7	968	1.6
Central	Top	147	1676	1746	4.2	1780	1.9
	Average	120	1386	1446	4.3	1486	2.8
	Poor	95	1043	1082	3.7	1099	1.6
Southwest	Top	139	1694	1720	1.5	1738	1.0
	Average	113	1222	1245	1.9	1265	1.6
	Poor	89	816	832	2.0	842	1.2
Southeast	Top	126	1113	1139	2.3	1146	0.6
	Average	104	850	871	2.5	879	0.9
	Poor	83	647	658	1.7	661	0.5
Indiana	Top	140	1535	1589	3.5	1616	1.7
	Average	113	1178	1223	3.8	1243	1.6
	Poor	89	836	861	3.0	873	1.4
	Transition*		2924	3055	4.5	3144	2.9

* Land moving out of agriculture.

Average land (113 bushel yield) was valued at \$1223 per acre, while the 89 bushel poor land was estimated to be worth \$861 per acre. Land values per bushel of yield estimate were \$10.82 on average land and \$9.67 on poor land. These per bushel figures are \$.43 higher than last year on top land, \$.61 on average land and \$.16 higher on poor land.

Transition land (that moving into nonfarm uses) was estimated to have a value of \$3055 per acre in June 1990, up 4.5 percent for the six months ending in June (Table 1). The six-month change probably is a better indication of the strength in these land values than the 1.7 percent increase for the 12 month period (Table 2). Only 43 percent of the respondents report on transition land values, the range in estimates is quite wide and the reliability of the averages is not as good as with farmland.

Statewide Rents Increase

Cash rents increased statewide from 1989 to 1990 by about 2 percent on top land, 3.6 percent on average land and a little over 3 percent on poor land (Table 4). The estimate for average land was \$87 per acre, \$3 more than last year's estimate. Rent per bushel of estimated yield was \$.77 for top and average land and \$.04 per bushel less on poor land. Cash rent on average land in 1990 was 18 percent below 1981 level and nearly equal to the 1977 estimate (Figure 1).

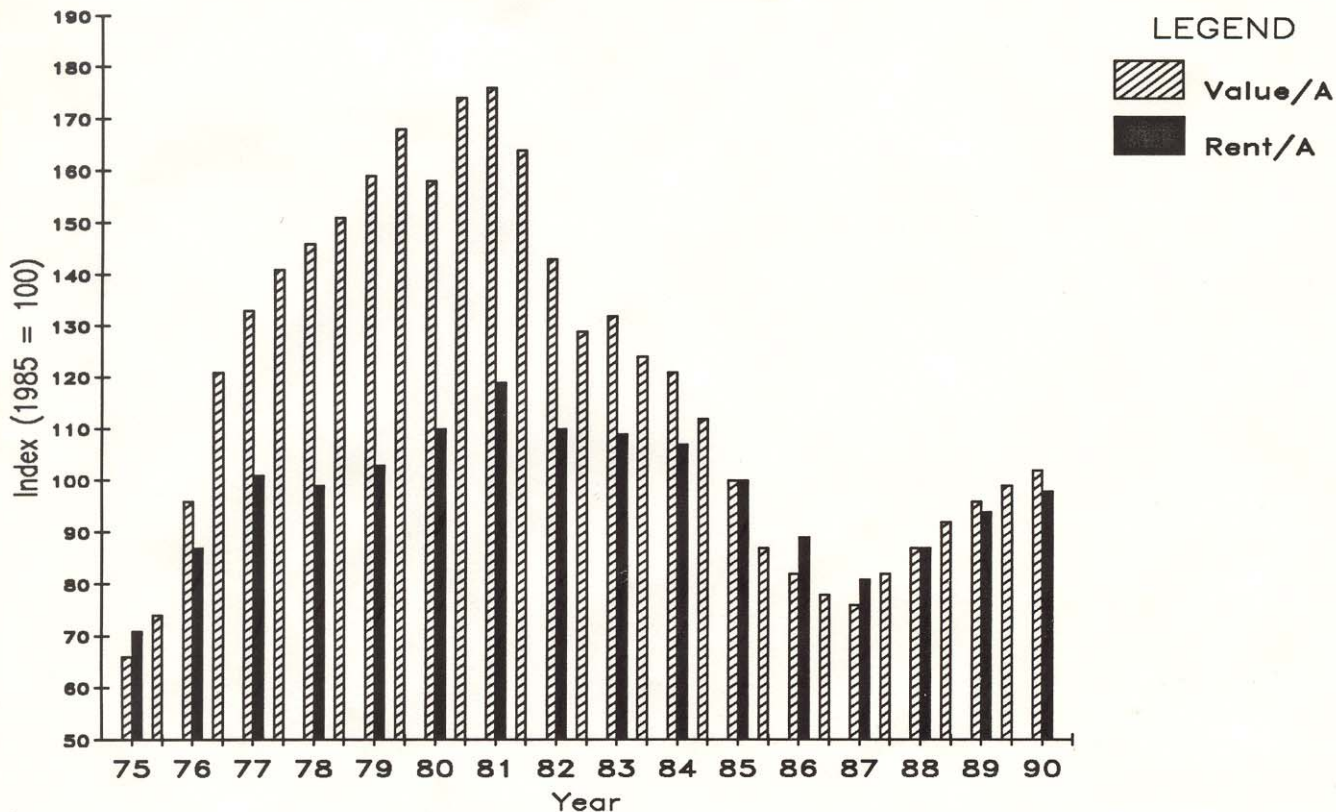
Cash rent as a percent of estimated land value declined slightly for the third year in a row (Table 4). State average figures for 1990 are 6.8 percent for top land, 7.1 percent for

Table 2. June 1989 and June 1990 average estimated land value per acre (tillable, bare land) and percentage change by geographic area and land class, Purdue Land Values Survey, July 1990.

Area	Class	Land Value		Percentage Change %
		June 1989 \$	June 1990 \$	
North	Top	1482	1581	6.7
	Average	1065	1173	10.1
	Poor	729	796	9.2
Northeast	Top	1488	1543	3.7
	Average	1082	1116	3.1
	Poor	747	748	0.1
W. Central	Top	1568	1642	4.7
	Average	1255	1337	6.5
	Poor	913	953	4.4
Central	Top	1688	1746	3.4
	Average	1349	1446	7.2
	Poor	999	1082	8.3
Southwest	Top	1564	1720	10.0
	Average	1162	1245	7.1
	Poor	779	832	6.8
Southeast	Top	1126	1139	1.2
	Average	826	871	5.4
	Poor	629	658	4.6
Indiana	Top	1518	1589	4.7
	Average	1154	1223	6.0
	Poor	818	861	5.3
	Transition*	3003	3055	1.7

* Land moving out of agriculture.

Figure 1. Index of Estimated Land Value (June & December) and Annual Cash Rent, Average Land, Indiana, 1975 - 1990



average land, and 7.5 percent for poor quality land. Ten years ago, in 1979, following several years of big increases in land values the \$88 rent reported for average cropland was only 4.8 percent of the estimated value of that quality land.

Area Estimates

Farmland value increases from December 1989 to June 1990 were mostly 4 percent to 5 percent in the north and the two central areas (Figure 2) and 2.9 percent or less in the northeast and the two southern areas (Table 1). These increases are slightly less than were reported for the December to June period last year.

For the year ending June 1990, average land in the north was estimated to have increased 10.1 percent (Table 2). The smallest increase in average land, 3.1 percent, was in the northeast while increases averaged between 5.4 percent and 7.2 percent in the other areas. Area increases for both top and poor land were more variable. Top land was up 10 percent for the year in the southwest and poor land increased 9.2 percent in the northeast. Increases in other areas for these two classes of land ranged from under 1 percent to 8.3 percent.

The percentage increase from the low land values of 1987 has been greater in the southwest than in other areas, ranging from 42 percent to 45 percent for all classes of land. In the other areas, top land increased from 29 percent to 34 percent. This range, except the southwest, was greater for average land (29 percent to 37 percent) and poor land (30 percent to 40 percent) than for top land.

The central area, with an average of \$1746 per acre for top land, again had the highest per acre values; however, values in the southwest would be higher for land of the same yield potential. Top land value per bushel of estimated yield (Table 3) was \$12.37 in the southwest and \$11.88 in the

Table 3. Land value per bushel of estimated corn yield, Purdue Land Values Survey, Indiana, July 1990.

Area	Land Class		
	Top	Average	Poor
North	\$11.29	\$10.57	\$ 9.36
Northeast	11.26	10.15	8.80
W. Central	11.48	11.24	10.25
Central	11.88	12.05	11.39
Southwest	12.37	11.02	9.35
Southeast	9.04	8.38	7.93
Indiana	11.35	10.82	9.67

central area. The southeast had the lowest value per bushel (\$9.04 for top land) as well as the lowest value per acre.

Because of the tendency for production costs per bushel to decline as land quality increases, it would be expected that land value per bushel would decrease as yield or land quality decreased. This was true except in the central area where the value per bushel for average land was slightly higher than for top land. The difference was slight in the west central area, suggesting that top quality land may, in many cases, be undervalued relative to lower quality land. Differences in costs per bushel by land quality were the greatest in the southwest.

Cash rents increased in all four of the central and northern areas of the state by \$2 to \$5 per acre or about 3 percent to 5.6 percent (Table 4). Average rents in the two southern areas were stable to higher.

Although land values were highest in the central area, cash rents were highest in the west central area, \$125 per acre on top quality land or \$.87 per bushel. In the north, west central and central areas rents on top and average land were \$.78 to \$.88. The range in other areas was \$.63 to \$.74 except for poor land in the southeast (\$.59).

There was little difference in the rent per bushel on top and average land, although budget analysis indicates that a

Table 4. Average estimated cash rents, bare tillable land, 1989 and 1990, Purdue Land Values Survey, Indiana, July 1990.

Area	Class	Corn bu/A	Rent/Acre		Percent Change 89 to 90 %	Rent/bu. of Corn 1990 \$	Rent as a % of June Land Value	
			1989 \$	1990 \$			1989 %	1990 %
North	Top	140	106	111	4.7	0.79	7.2	7.0
	Average	111	83	87	4.8	0.78	7.8	7.4
	Poor	85	59	62	5.1	0.73	8.1	7.8
Northeast	Top	137	92	97	5.4	0.71	6.2	6.3
	Average	110	73	75	2.7	0.68	6.7	6.7
	Poor	85	54	57	5.6	0.67	7.2	7.6
W. Central	Top	143	120	125	4.2	0.87	7.7	7.6
	Average	119	100	105	5.0	0.88	8.0	7.9
	Poor	93	76	80	5.3	0.86	8.3	8.4
Central	Top	147	116	119	2.6	0.81	6.9	6.8
	Average	120	96	99	3.1	0.83	7.1	6.8
	Poor	95	75	79	5.3	0.83	7.5	7.3
Southwest	Top	139	101	103	2.0	0.74	6.5	6.0
	Average	113	79	79	0.0	0.70	6.8	6.3
	Poor	89	57	57	0.0	0.64	7.3	6.9
Southeast	Top	126	82	82	0.0	0.65	7.3	7.2
	Average	104	63	66	4.8	0.63	7.6	7.6
	Poor	83	45	49	8.9	0.59	7.2	7.4
Indiana	Top	140	106	108	1.9	0.77	7.0	6.8
	Average	113	84	87	3.6	0.77	7.3	7.1
	Poor	89	63	65	3.2	0.73	7.7	7.5

difference of \$.10 per bushel or more could be justified in many situations between average and top quality land.

Cash rent as a percent of the value of top and average land tended to fall slightly in all areas except the northeast and southeast where there was a mixture of increases, decreases and no change. These area average percentages fell in the range of 6.0 percent to 8.4 percent with the higher figures being in the west central area and the lower ones in the southwest. For many years prior to the early 1970s, cash rent as a percent of Indiana land values generally fell in the range of 6 percent to 8 percent; however, by 1979 this percentage had fallen below five percent on a statewide basis. With falling land values, the percentage rose, peaking in 1986 with a state estimate of over 8 percent on average land. We are now back in the "thumb rule" range of 6 percent to 8 percent.

Outlook

There was little change from last year in expectations for short run increases in land values. About 62 percent expect some or all classes of land to increase, up from 58 percent last year. But the average amount of increase was smaller — 1.6 percent for average land (Table 1) versus 2.7 percent last year. Only about 7 percent expected declines in some or all classes of land. Small increases of under 3 percent were expected in all areas of the state, with one exception: average land in the northeast was expected to decline, but by less than 1 percent.

Eighty-eight percent of the 1990 respondents expect land values to be higher five years hence. The group average change was 13 percent this year, down from 15 percent last year.

Respondents were asked to estimate annual average over the next five years for corn and soybean prices, farm mortgage interest rates and the rate of inflation. The projections they made in each year since 1984 are shown below:

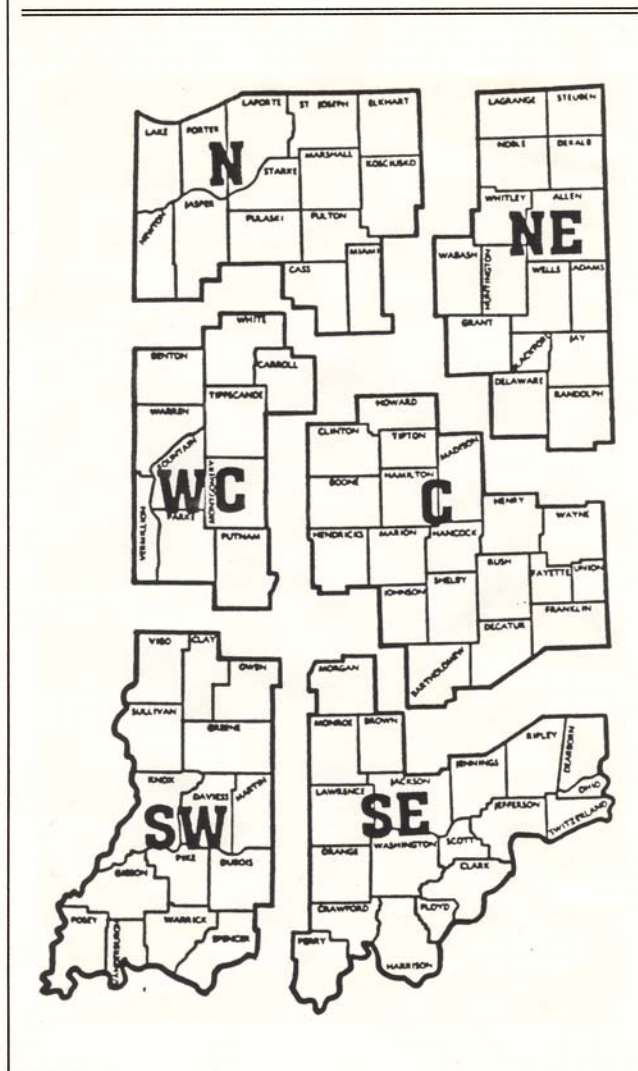
Item	1984	1985	1986	1987	1988	1989	1990
Corn price	\$3.13	\$2.70	\$2.32	\$2.16	\$2.50	\$2.48	\$2.61
Bean price	7.35	6.13	5.43	5.62	6.82	6.55	6.22
Interest rate	13.3	12.3	11.0	10.7	10.9	11.0	11.0
Inflation rate	6.5	5.1	4.2	4.5	4.6	4.7	4.6

The expectations for higher corn prices and lower bean prices probably were influenced by crop conditions in mid-to late June. Interest rate expectations were the same as last year, breaking the slight upward trend of the previous two years. The three-year upward trend in inflation rate expectations was reversed.

Whether or not Indiana and other cornbelt land values continue to increase the rest of this year and into 1991 depends upon such factors as the extent of crop losses in some areas due to excessive spring rains, and whether crop size and utilization projections indicate the likelihood of an increase in stocks to burdensome levels. The final form of the new farm bill could provide either a positive or negative effect on land values.

Over the longer run, positive influences include a growing world population, the relatively favorable ratio of debt to land assets, increasing demand for industrial uses of grain and the possibility of lower trade barriers. A cloud on the horizon is the possibility that little will be done about the

Figure 2. Geographic Areas Used in the Purdue Land Values Survey



Federal budget deficit with the result that interest rates will need to be kept high in order to finance the deficit. Land prices also would likely be influenced negatively if government farm program payments are reduced substantially or eliminated.

The land values survey was made possible by the cooperation of professional farm managers, appraisers, brokers, bankers, and persons representing the Farm Credit System, the Farmers Home Administration, ASCS county offices and insurance companies. Their daily work requires that they keep well-informed about land values and cash rent in Indiana. To these friends of Purdue and Indiana agriculture, sincere thanks are expressed. They provided more than 300 responses representing most of Indiana's counties. Appreciation is also expressed to Julie Gable of the Department of Agricultural Economics for her help in conducting the survey and to Ag Econ professors Chris Hurt and Howard Doster for their review of this report and helpful suggestions.

Impact of Ractopamine Use on Hog Slaughter Weights, Feeding Period, and Returns with a Lean-Value Pricing System

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Introduction of the feed additive ractopamine into the swine industry offers the potential for increased efficiency and improved sector performance. Ractopamine affects swine growth by redirecting nutrients away from the production of fat tissue to the production of lean muscle. Results of some live animal ractopamine trials show improvements in average daily gain of 8 to 13 percent. Feed efficiency improves 10 to 20 percent, and backfat reductions of 12 to 20 percent have also been observed.

What changes in management strategies may be necessary for the successful integration of ractopamine into the hog production system? This study determined economically optimal slaughter weights, days on feed, and average daily profits for low, medium, and high genetic potential animals produced with and without ractopamine. In addition, the economic impacts of a lean value pricing system were analyzed.

Procedure

A swine growth simulation model originally developed by North Central Region Research Committee NC-179 was adapted for use in this study. The model was modified to incorporate ractopamine use. In addition, an accounting system for costs and revenues, and an adjusted lean growth curve to better reflect the genetic characteristics of U.S. hogs was added. The model determined economically optimal slaughter weights based on the goal of maximizing average daily profits.

Costs were designed to reflect high-investment Indiana feeder pig finishing operations. Control and ractopamine fed pigs were simulated with three different genetic potentials; low, medium, and high lean growth. The genetic potential of an animal is defined as the animal's maximum protein deposition when protein and energy intake are not limiting factors. These protein deposition rates correspond to 0.57, 0.69, and 0.81 pounds of lean growth per day from 66 to 235 pounds and were drawn from different breeds and crosses representing the industry standard, plus and minus one standard deviation.

To model the addition of ractopamine in the diet, the maximum protein deposition per animal was increased by 25 grams per day during the last 90 pounds of live weight gain (the recommended ractopamine feeding period), regardless of genetic potential. As a result, hogs with a lower genetic potential show a greater percentage response to ractopamine than hogs with a higher initial genetic potential.

Current animal science research suggests that as the animal is fed ractopamine, daily protein requirements of the animal will increase. For this study, the control group received a 16 percent crude protein diet up to 110 pounds and then a 14 percent diet until slaughter. The ractopamine fed pigs, however, were given a 16 percent diet throughout the feeding period.

The average live weight market price in Indiana for pigs ranging from 235 to 270 pounds was near \$45.00 per hundred weight for 1989. This base price of \$45.00 per hundred weight was adjusted according to a discount schedule to obtain prices for hogs in alternative weight ranges. When determining the discount schedule, Heinold, Hoosier Stockyard, and the Indianapolis Stockyard were consulted. Based on their recommendations, the discount schedule presented in Table 1 was used in this analysis.

Table 1. Discount Schedule for Alternative Weight Hogs.

Weight (lbs)	Discount (\$/cwt)
205 < 210	11.80
210 < 220	7.70
220 < 233	3.20
233 < 270	0.00
270 < 280	1.00
280 < 290	1.80
290 < 300	3.20

Cost coefficients, based on average 1989 Purdue Budgets (Schulte et al.), were broken down into four categories; fixed, facilities, labor, and feed. Per animal fixed costs included: (1) the purchase price of the feeder pig (\$31.90) (assumed constant across all genetic lines), (2) a one-time medication charge (\$1.30), (3) marketing charges (\$1.00), and (4) miscellaneous charges (\$1.88; \$1.02 of which accounts for a 3 percent death loss charge). Summing these gave a total fixed cost of \$36.08 per animal.

Facilities costs, based on Purdue ID-173 (Bache et al.), included: (1) fuel, electricity, and equipment repair charges of \$0.0152 per pig per day, (2) an equipment charge of \$0.0441 per pig per day, (3) building construction and repair charges of \$0.0272 per pig per day, and (5) a production inventory charge of \$0.0195 per pig per day. Total facilities costs per animal per day were \$0.106. Finally, a labor cost of \$0.0246 per pig per day was included (Bache et al.).

Feed costs were based on a standard corn-soybean meal diet consisting of 8.5 percent crude protein corn, 44 percent crude protein soybean meal, and a base-mix consisting of vitamins and minerals. In Indiana the 1989 price estimates for corn and soybean meal were \$2.60 per bushel and \$250 per ton, respectively. The base-mix price was \$17.75 per hundred weight. Based on these values, the cost of 16 percent crude protein feed was \$0.0705 per pound (\$141 per ton) and the cost of 14 percent crude protein feed was \$0.0661 per pound (\$132.20 per ton).

The actual cost of ractopamine is not known since the manufacturer has yet to establish a price. Studies of similar biotechnological products such as bovine somatotropin (bST) in the dairy sector suggest that farmers will not likely adopt a new technology unless they can obtain a \$2 net

return for each \$1 in cost. The same assumption was employed in this analysis.

Using the \$2 to \$1 average net return pricing rule, the estimated cost to producers of ractopamine per pound of feed was calculated. Assuming \$45 live weight pricing with no charge for ractopamine, the additional return for ractopamine averages 3.5 cents per day during the entire feed period for all genetic potentials. If one-third of this benefit represented the cost of ractopamine, this would be 1.17 cents per day over the entire feeding period. Assuming that ractopamine is fed approximately the last half of the feeding period, the daily charge for ractopamine would average 2.34 cents. The average daily feed intake across all genetic potentials for the entire feeding period is 4.87 pounds. Therefore, the estimated price of ractopamine to hog producers is assumed to be $2.34/4.87$, or an additional 0.48 cents per pound of feed containing ractopamine.

Consequences of Ractopamine Introduction for Three Genetic Lines

Six model simulations were conducted using low, medium, and high genetic potential lines with and without ractopamine. The following discussion centers around the biological and economic changes that occur when ractopamine is added to the diet (Table 2).

Biological Analysis

It is a common belief in the industry that market weights will rise with the use of ractopamine. How do optimal slaughter weights change with the use of ractopamine? Based on the model simulations, with the stated hog price and production cost assumptions, the optimal slaughter weights remain constant across all three genetic lines, regardless of whether or not ractopamine is fed. These results are discount driven. Once the animal can be sold without a heavy penalty, 233 pounds, the model suggests selling the pig and bringing in a new feeder pig that can

transform feed into live weight more efficiently than feeding a 233 pound animal to even heavier weights.*

Ractopamine use can reduce days on feed, increase feed efficiency, and increase the percent carcass lean. Reductions of 7, 6, and 5 days can be realized for low, medium, and high genetic potential animals, respectively. The reductions in days on feed is the result of an improvement in average daily gain of 0.11 pounds per day across all genetic lines.

The reduction in average daily feed consumption with ractopamine was 0.16, 0.18, and 0.18 pounds per day for low, medium, and high genetic potential animals, respectively. Improvements in the feed to gain ratio of 9.3, 8.9, and 8.2 percent also were realized for low, medium, and high genetic potential animals, respectively.

Improvements in the percent lean ranged from 5.0 percentage points for low genetic potential pigs to 4.1 percentage points for high genetic potential pigs. With the feeding of ractopamine, total carcass lean was increased by 9.9, 9.3, and 8.6 pounds while fat content was decreased by 7.7, 7.1, and 6.2 pounds, respectively, for low, medium, and high genetic lines. Moreover, backfat was reduced by 0.18, 0.15, and 0.12 inches for low, medium, and high genetic lines.

Economic Analysis

The primary economic impacts of ractopamine use are reductions in variable costs for feed, facilities, and labor due to the reduction in days on feed. Feed costs declined slightly when animals were fed ractopamine. Reductions in feed costs of 1.3, 0.9, and 0.2 percent were observed for low, medium, and high genetic lines, respectively.

The greatest savings came in the form of reduced facilities costs. As the time on feed was reduced, the cost of facilities per animal declined 6.0 percent for low, 5.7 per-

* Analysis was conducted to determine the sensitivity of optimal slaughter weights to fixed and feed costs. Slaughter weights were only found to be sensitive to high fixed costs.

Table 2. Biological and Economic Results for Three Genetic Potentials Grown With and Without Ractopamine.

Genetic Potential Ractopamine	Low		Medium		High	
	Without	With	Without	With	Without	With
<i>Biological Analysis^{a/}</i>						
Optimal Live Weight (#)	234.35	234.57	234.79	235.01	233.91	234.13
Days on Feed	117	110	106	100	97	92
ADG (#/day)	1.63	1.74	1.81	1.92	1.96	2.07
ADF (#/day)	5.05	4.89	5.05	4.87	5.03	4.85
F/G (# feed/# gain)	3.11	2.82	2.81	2.56	2.56	2.35
Total Feed (#)	590.83	537.92	535.71	487.21	487.21	447.53
Backfat Thickness	1.43	1.25	1.24	1.09	1.09	0.97
Percent Lean	46.80	51.80	50.60	55.20	53.60	57.70
Total Carcass Lean (#)	81.35	91.27	87.96	97.22	92.81	101.41
Carcass Fat (#)	64.15	56.44	56.66	49.60	50.26	44.09
<i>Economic Analysis</i>						
Total Revenue (\$/head)	\$105.50	\$105.59	\$105.65	\$105.75	\$105.30	\$105.41
Costs (\$/head)						
Fixed	\$36.08	\$36.08	\$36.08	\$36.08	\$36.08	\$36.08
Feed	\$39.79	\$39.28	\$36.01	\$35.69	\$32.74	\$32.65
Facilities	\$12.40	\$11.66	\$11.24	\$10.60	\$10.28	\$9.75
Labor	\$2.88	\$2.71	\$2.61	\$2.46	\$2.39	\$2.26
Total Costs	\$91.14	\$89.73	\$85.93	\$84.83	\$81.49	\$80.74
Profit	\$14.36	\$15.86	\$19.72	\$20.92	\$23.81	\$24.67
Average Daily Profit	\$0.1227	\$0.1442	\$0.1860	\$0.2092	\$0.2455	\$0.2681

a/ ADG refers to average daily gain, ADF refers to average daily feed intake and F/G refers to pounds feed per pound of gain.

cent for medium, and 5.2 percent for high genetic potential pigs.

Finally, since the pigs were kept fewer days, feeding ractopamine helped lower total labor costs per animal, assuming negligible additional labor requirements to administer the compound. Labor costs declined 5.9, 5.7, and 5.4 percent for low, medium, and high genetic potential animals, respectively.

Increases in net revenue per pig were \$1.50, \$1.20, and \$0.86 for low, medium, and high genetic potential animals, respectively. Likewise, average daily profit increased with the use of ractopamine. Increases of 2.15, 2.32, and 2.26 cents per day for low, medium, and high genetic potential animals, respectively, were observed.

Lean Value Marketing Analysis

An issue of considerable interest in the swine industry in recent years is the potential for conversion from live weight pricing of market hogs to lean value pricing. This would involve paying producers different prices for lean and fat, rather than a single price for overall body mass, thus rewarding producers of leaner animals.

This study examined a lean value pricing system which included a price for lean, a price for fat, and a price for byproducts. The price of lean and fat is on a per pound basis while the byproduct price is a fixed dollar amount per pig. According to Whipker and Akridge, the average 1989 yellow sheet price for byproducts was \$8.72 per pig. The lean to fat price ratios (3/1, 4/1, 5/1, 6/1) found in Table 3, based on a live weight price of \$0.45 per pound, were calculated so that producers of non-ractopamine fed medium genetic potential animals would remain indifferent between the live

weight and lean value pricing for animals sold at an optimal weight based on maximum average daily profit.

According to this analysis, optimal slaughter weights and the number of days on feed are insensitive to the different pricing systems. Maximum average daily profits, however, changed rather drastically depending on the ratio selected. Research conducted by Whipker and Akridge at Purdue University indicates that the ratio that processors most likely will use lies between 4:1 and 5:1. Therefore, even though the 3:1 and 6:1 price ratios are presented in Table 3, the following discussion focuses on the 4:1 and 5:1 price ratios.

As expected, a producer of low genetic potential pigs who is not feeding ractopamine would lose revenues by switching to the lean value pricing system (Table 3). Due to insufficient lean, producers of these pigs would experience a drop in average daily profits of 3.78 cents with the 4:1 price ratio and 4.20 cents with the 5:1 price ratio. Producers adding ractopamine to the diet of low genetic potential pigs would experience a much different outcome, however. Instead of a 3.78 cent loss in average daily profits with the 4:1 price ratio, these producers would realize a 2.75 cent increase. Likewise, with the 5:1 price ratio, producers using ractopamine would realize a 2.84 cent increase in average daily profits.

By assumption, the non-ractopamine fed medium genetic potential pigs would experience no change in average daily profits with a lean value pricing system. However, producers feeding ractopamine to these animals would realize a 6.99 and 7.54 cent increase in average daily profits with 4:1 and 5:1 price ratios, respectively.

Producers of high genetic potential pigs would benefit from the lean value pricing system regardless of whether or

Table 3. Optimal Slaughter Weight, Maximum Average Daily Profit, and Days on Feed When Sold Under Various Lean to Fat Price Ratios.

Feed, Genetic Potential Characteristic	Live Weight	Pricing System ^{a/}			
		3/1	4/1	5/1	6/1
Lean Price (live weight) (\$/#)	0.670	0.907	0.949	0.976	0.995
Fat Price (\$/#)	0.670	0.302	0.237	0.195	0.166
Byproduct Credit (\$/pig)	8.720	8.720	8.720	8.720	8.720
No-rac, Low					
Optimal Weight (lbs.)	234.35	234.35	234.35	234.35	234.35
Max. Avg. Daily Prof. (cents)	12.27	9.15	8.49	8.07	7.77
Days on Feed	117	117	117	117	117
Rac, Low					
Optimal Weight (lbs.)	234.57	234.57	234.57	234.57	234.57
Max. Avg. Daily Prof. (cents)	14.42	17.03	17.17	17.26	17.32
Days on Feed	110	110	110	110	110
No-rac, Medium					
Optimal Weight (lbs.)	234.79	234.79	234.79	234.79	234.79
Max. Avg. Daily Prof. (cents)	18.60	18.57	18.57	18.57	18.57
Days on Feed	106	106	106	106	106
Rac, Medium					
Optimal Weight (lbs.)	235.01	235.01	235.01	235.01	235.01
Max. Avg. Daily Prof. (cents)	20.92	27.06	27.91	28.46	28.84
Days on Feed	100	100	100	100	100
No-rac, High					
Optimal Weight (lbs.)	233.91	233.91	233.91	233.91	233.91
Max. Avg. Daily Prof. (cents)	24.55	27.48	28.12	28.53	28.82
Days on Feed	97	97	97	97	97
Rac, High					
Optimal Weight (lbs.)	234.13	234.13	234.13	234.13	234.13
Max. Avg. Daily Prof. (cents)	26.81	36.23	37.73	38.70	39.38
Days on Feed	92	92	92	92	92

^{a/} Pricing schemes used are live weight and the lean to fat price ratios 3/1, 4/1, 5/1, and 6/1.

not they feed ractopamine. Producers not feeding ractopamine would experience an increase in average daily profits of 3.57 cents for a 4:1 price ratio and 3.98 cents for a 5:1 price ratio. Producers feeding ractopamine to these high genetic potential pigs, however, would realize a 10.92 cent and 11.89 cent increase in average daily profits per animal for 4:1 and 5:1 price ratios, respectively.

Under the live weight pricing system, the returns to ractopamine use (the difference in maximum average daily profit of the non-ractopamine fed animal and the ractopamine fed animal) was 2.15 cents for low, 2.32 cents for medium, and 2.26 cents per day for high genetic potential animals at 235 pounds, respectively. Assuming a constant cost for ractopamine, returns to ractopamine increase dramatically as the lean value price ratio increased (Figure 1).

A shift from a live weight price to a 2:1 lean value pricing system resulted in the greatest increase in maximum average daily profits and the greatest returns to ractopamine. Compared to a live weight pricing system, the 4:1 price ratio resulted in increased returns to ractopamine of 6.53 cents per day for low, 7.02 cents per day for medium, and 7.35 cents per day for high genetic potential pigs, respectively. Compared to a 4:1 lean to fat price ratio, the 5:1 price ratio added an additional 0.51 cents per day for low, 0.55 cents per day for medium, and 0.56 cents per day for high genetic lines (Figure 1).

Summary

Simulation methods were used to evaluate changes in economically optimum management strategies with the use of ractopamine for alternative genetic lines. The principal effect of ractopamine use is to reduce the number of days on feed required to bring a hog to market weight. Given this, and an improved feed to gain ratio which helps reduce feed costs, producers (with live weight pricing and the assumed price for ractopamine) can realize an increase in net returns

of approximately 2.3 cents per pig per day, on average, across all genetic lines analyzed.

A lean value pricing system was analyzed using a range of lean to fat price ratios. Producers of low genetic potential animals not fed ractopamine would prefer the live weight pricing system because their animals are not lean enough to benefit from the lean value pricing system. All other producers would either prefer, or be indifferent to, the lean value pricing system. Assuming that the lean to fat price ratio selected by the packing industry is in the 4:1 to 5:1 range, producers feeding ractopamine could realize a 2.75 to 10.92 cent increase in average daily profits for a 4:1 price ratio and a 2.84 to 11.89 cent profit increase with a 5:1 price ratio for low and high genetic potential lines, respectively. Compared to live weight pricing, the lean value pricing system would increase net returns to ractopamine by an average (across all genetic lines) of 6.97 cents per day with a 4 to 1 lean to fat price ratio and 7.51 cents per day with the 5 to 1 price ratio.

Ractopamine can provide hog producers with a new means to more efficiently produce lean hogs and increase profits. However, success will depend on careful selection of genetics, economically optimal rations, and the introduction of a lean value pricing system by packers.

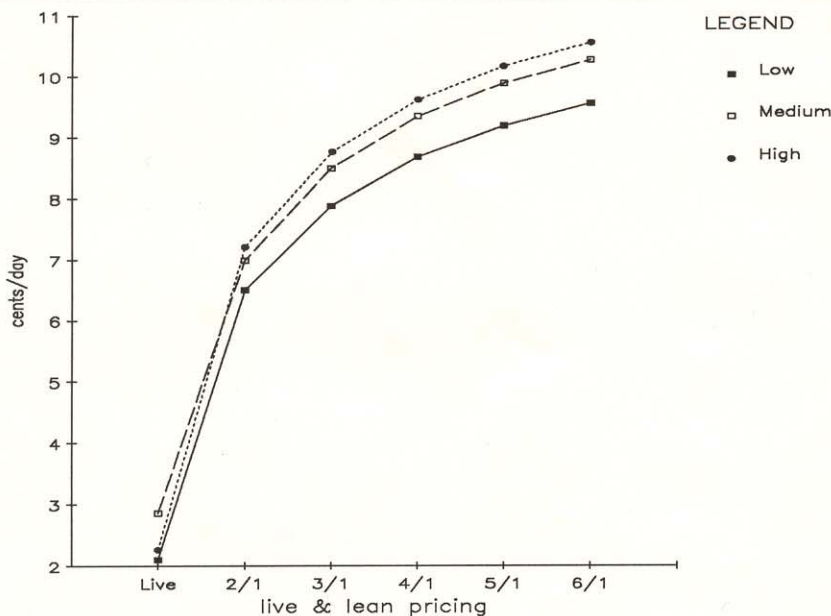
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Figure 1. Returns to Ractopamine for Live and Alternative Lean to Fat Price Ratios at 235 Pounds.



Fall Outlook Meetings

County	Date	Time	Location
Adams	September 18	7:00 pm	Fairgrounds, Monroe
Allen	September 13	6:00 pm	Woodland High School
Benton	September 13	7:30 am	4-H Bldg., Fairgrounds, Boswell
Blackford	September 12	7:00 am	4-H Bldg., Hartford City
Boone	September 10	7:00 am	4-H Fairgrounds, Lebanon
Carroll	September 13	7:30 pm	4-H Bldg., Flora
Cass	September 10	8:00 am	4-H Park, Logansport
Clark	December 11	7:30 am	Clark County 4-H Center, Charlestown
Clay/Vigo	September 17	7:30 am	Jackson's Bluebonnet Restaurant, Brazil
Clinton	September 19	7:30 am	4-H Bldg. Fairgrounds, Frankfort
Crawford	December 12		TO BE ANNOUNCED
Daviess	September 19	12 (noon)	Der Deutsche Gasthof, Montgomery
Dekalb	September 13	7:00 pm	4-H Exhibit Hall, Auburn
Delaware	September 11	8:00 am	Fairgrounds, Muncie
Dubois	September 18	morning	TO BE ANNOUNCED
Elkhart	September 17	7:30 pm	4-H Fairgrounds, Goshen
Fayette	September 20	6:30 pm	Miller Cafeteria, Connersville
Fulton	September 18	7:00 am	4-H Fairgrounds, Rochester
Grant	September 20	breakfast	TO BE ANNOUNCED
Greene	September 17	7:00 pm	Greene CES, Fairgrounds, Bloomfield
Hamilton	September 13	breakfast	TO BE ANNOUNCED
Hancock	September 10	7:00 am	Mac's Restaurant, Greenfield
Henry	September 12	7:00 am	Mac's Restaurant, Newcastle
Huntington	September 19	7:30 am	Hub Huntington
Jackson	September 20	9:00 am	Central Christian Church, Seymour
Jasper	September 12	7:30 pm	Fairgrounds, Rensselaer
Jay	September 11	7:30 am	Richard Restaurant, Portland
Johnson	September 21	7:00 am	Franklin College, Franklin
Kosciusko	September 10	7:30 pm	Justice Bldg., Warsaw
LaGrange	September 12	7:30 pm	Prairie Heights School
Lawrence	September 17	6:30 pm	Hub Restaurant, Bedford
Madison	September 14	7:30 am	4-H Fairgrounds, Alexandria
Montgomery	September 14	breakfast	TO BE ANNOUNCED
Morgan	September 20	6:30 pm	4-H Fairgrounds, Martinsville
Newton	September 11	7:30 pm	S. Newton High School
Orange	December 11	7:30 pm	Easterday Brothers Implement, Orleans
Porter	September 18	7:30 am	Basement FB Ins. Bldg., Valparaiso
Posey	September 12	5:30 pm	Redman Farm, Wadesville
Pulaski	September 13	7:30 am	4-H Fairgrounds, Winamac
Putnam	September 12	6:30 am	TO BE ANNOUNCED
Randolph	September 19	7:30 am	D&J Restaurant, Winchester
Rush	September 20	7:30 am	St. Mary's, Rushville
Scott	December 12	7:30 am	Best Western, Scottsburg
Shelby	September 10	7:30 pm	Fairgrounds, Shelbyville
Steuben	September 19	7:30 pm	CES office, Angola
St. Joseph	September 12	7:30 pm	Laville H.S., Lapaz
Sullivan	September 19	7:00 pm	4-H Bldg., Sullivan
Switzerland	September 18	afternoon	TO BE ANNOUNCED
Tipton	November 27	10:00 am	Library, Tipton
Vermillion/Warren/Fountain	September 13	6:30 pm	Beef House, Covington
Wabash	September 13	7:00 am	4-H Fairgrounds, Wabash
Warrick	September 13	breakfast	TO BE ANNOUNCED
Washington	September 19	6:30 am	Extension office, Salem
Wayne	September 18	7:00 am	Land's Inn Restaurant, Hagerstown
Wells	September 14	7:00 am	4-H Park, Bluffton
White	September 14	7:30 am	Fairgrounds, Reynolds
White	September 20	5:30 pm	Tri-County High School

U.S. Farmers' Agricultural and Trade Policy Preferences

Marshall A. Martin, Professor and Dennis A. Shields, Research Assistant

The U.S. Congress is currently writing the 1990 Farm Bill that will establish the direction of U.S. farm policies into the mid-1990s. The political process generating this new farm legislation involves input from many sources, including farmers.

The interpretation of U.S. farmers' opinions on agricultural and trade policies is usually left to the commodity and farm organizations that lobby on behalf of their members. Unbiased evaluation of farmers' opinions across many commodities and organizations is seldom done. Statistical analysis of farmers' opinions based on a scientifically designed survey instrument, such as the one used in this study, thus can help policymakers and policy analysts more comprehensively understand what U.S. farmers desire in farm legislation, and what socioeconomic factors may influence their preferences.

Farmers normally act in their own economic self-interest and attempt to maximize the present value of expected profits from their operations (Edelman and Lasley). This implies that a farmer will support (oppose) policies that offer higher (lower) expected benefits relative to the alternatives. The level of support or opposition for various agricultural and trade policies may be explained by differences in farmers' socioeconomic characteristics such as education level, age, farm organization affiliation, gross farm sales, farm type, off-farm income, program participation, and geographic region.

Data

This study is based on survey data from *U.S. Farmers' Preferences for Agricultural and Food Policy in the 1990s* (Guither, *et al.*). The survey sample consisted of 12,778 farmers from 21 states and was judged representative of all U.S. farmers. These 21 states represent two-thirds of the nation's cropland and account for 58 percent of all farms in the nation. Farmers in these states produce over one-half of all U.S. farm production, including 70 percent of the food grains, 71 percent of the feed crops, 71 percent of the soybeans, 60 percent of the cotton, and 70 percent of the livestock.

The survey collected information on farmers' preferences on a variety of agricultural issues, including the future direction of commodity programs, conservation policies, and international trade. Socioeconomic data also were collected.

Farmers' Preferences

The discussion of farmers' policy preferences is divided into two parts. First, the overall results are summarized. Second, the influence of various socioeconomic factors on farmers' preferences are considered. The following policy issues were selected for analysis: direction of general agricultural commodity policy, target price and loan rate policies, dairy policy, crop insurance and disaster programs, the Conservation Reserve Program, conservation compliance requirements, reduction in international trade bar-

riers, and the Export Enhancement Program (EEP) (Table 1).

Overall Results

General Farm Policy. Over one-half of the survey respondents wanted some kind of price and income support program. About one-third wanted to keep the present program, 11 percent preferred mandatory controls, and 8 percent preferred decoupling of payments from production requirements. However, about one-third wanted to gradually eliminate commodity programs, including acreage set aside and deficiency payments.

Target Price Policy. Target prices are a popular part of the current price and income support program. A majority of farmers preferred the continuation of target prices; 38 percent wanted to raise them; 12 percent favored present levels; and 9 percent wanted to lower them. However, about one-fourth wanted to phase them out.

Loan Rate Policy. The most preferred loan rate policy was to base loan rates on a five-year average of market prices to keep prices competitive (36 percent). However, a similar number (34 percent) wanted to eliminate loan rates and commodity loans. About one-fifth wanted higher loan rates.

Dairy Policy. Among all farmers, responses were divided on future dairy policy. Although 37 percent favored some type of dairy price support program, 17 percent favored the current program, while 15 percent preferred a system that bases the milk support price on the average cost of production and establishes a production quota for each producer. Five percent wanted the Secretary of Agriculture to have more authority to set the milk price support. However, 29 percent favored phasing out all dairy price supports over a period of years. Thirty-four percent were either not sure or did not reply.

Crop Insurance. When asked what our national policy should be to protect farmers from production risks associated with natural disasters, farmers expressed a diversity of views. One-third wanted to keep the current voluntary crop insurance program, 21 percent preferred a limited disaster assistance program in years of severe drought with no crop insurance program, 13 percent preferred a mandatory crop insurance program, and 11 percent preferred the elimination of both crop insurance and disaster programs. The remainder were not sure or did not reply.

Conservation Compliance. Farmers were found to be very supportive of present government conservation efforts. Sixty percent favored soil conservation compliance as a condition for receiving commodity program benefits.

Conservation Reserve Program. The Conservation Reserve Program (CRP), established in the 1985 Food Security Act, received strong support. Among all respondents, only about one-fourth wanted to eliminate the program, while the remainder wanted to keep the acreage at the present level or expand it.

Trade Barrier Reduction. It is unclear if any substantial progress will be made in the current Uruguay Round of

GATT negotiations, and if so, how the negotiations will affect U.S. farm policy. The GATT negotiations are scheduled for completion in December 1990. Survey results indicated that farmers generally favor freer trade and support U.S. government efforts to improve international trade relations. Among all farmers, 71 percent agreed that the United States should negotiate world-wide reductions in trade barriers.

Continuation of the Export Enhancement Program. The EEP is a program primarily targeted towards regaining markets lost by the United States. Initially, the program targeted Middle Eastern and North African countries where wheat sales had been lost to heavily subsidized exports from the European Community. Later, EEP subsidized sales were expanded to the USSR, China, and others. Of all commodities, wheat exports have been assisted the most.

Despite the fact that 85 percent of the EEP funds have been used to subsidize wheat exports, almost one-half of all farmers agreed that the EEP program should be continued. Only 12 percent disagreed. However, 40 percent were not sure or did not respond.

Socioeconomic Factors

A statistical procedure called a logit model was used to identify those socioeconomic factors that influence U.S. farmers' agricultural policy preferences. A logit model was specified for each survey question. Each policy response was combined into one of two options: continued government intervention or less government intervention. This definition allows comparison across all types of policies. Although some specificity is lost when response categories for the policy alternatives are collapsed, this technique can ascertain and analyze farmers' basic preferences for government intervention in agriculture. The statistical results from the logit analysis are summarized in Tables 2 and 3.

General Policy. Less government intervention was defined as elimination of commodity programs. All other policy choices were classified as continued government intervention.

Farmers with a college education and livestock producers favor the elimination of all commodity programs. However, grain farmers, those farmers who earn at least \$20,000 of off-farm income, Southern farmers, participants in the corn and wheat programs, and Farmers Union members favor continued government intervention. Other socioeconomic factors such as age and gross farm sales give inconclusive results, i.e., not statistically associated with continued or less government intervention via commodity programs. With this information on farmer characteristics, it was possible to predict with 67 percent accuracy farmers' general farm policy preferences.

Target Price Policy. For target prices, a continued government program option was a combination of responses to continue present target prices and to increase target price levels. Less government involvement was defined as lower target prices or elimination of target prices. Two-thirds of the responses were correctly predicted.

Grain farmers support an increase in, or at least a continuation of, target prices. On the other hand, livestock producers would rather see target prices lowered or phased out. Livestock producers may oppose target prices because

Table 1. Farmer Preferences for Agricultural and Trade Policies.

Survey Question	Percent of Respondents
1. Preferred policy on production and price supports after 1990.	
Keep present program	33
Mandatory controls	11
Decoupling	8
Eliminate commodity programs	35
Other	5
No reply	8
	100%
2. Target price policy.	
Continue present levels	12
Raise target prices	38
Lower target prices	9
Phase out target prices	28
Other	3
No reply	10
	100%
3. Loan rate policy.	
Base loan rate on previous 5 yr. average	36
Raise loan rates	18
Eliminate loan rates and commodity loans	34
No response	12
	100%
4. Dairy policy.	
Continue present program	17
Set support price on average production costs and establish production quotas	15
Phase out price supports	29
Give Secretary of Agriculture authority to set price support	5
Not sure	25
No reply	9
	100%
5. Crop insurance.	
Continue current program of voluntary crop insurance	33
Disaster program but no crop insurance	21
No crop insurance nor disaster programs	11
Require farmers to buy crop insurance	13
Not sure	16
No reply	6
	100%
6. Continue conservation compliance requirements.	
Yes	60
No	22
Not sure	13
No reply	5
	100%
7. Conservation reserve policy.	
Maintain or expand 30 million acre level	60
Eliminate the CRP	26
Other	3
No reply	11
	100%
8. U.S. should negotiate world-wide trade barrier reductions.	
Agree	71
Disagree	6
Not sure	14
No reply	9
	100%
9. Continuation of the EEP.	
Agree	48
Disagree	12
Not sure	29
No reply	11
	100%

Source: Guither, et al.

only grain producers receive this subsidy. Furthermore, high target prices may have helped lower input costs for livestock producers, since historically deficiency payment incentives have stimulated grain production (more yield increasing input use) that lead to increases in grain stocks and downward pressure on feed grain prices.

Corn and wheat program participants and Farmers Union members favor relatively high target prices. Farmers with a college education prefer lower target prices or their complete elimination.

Loan Rate Policy. The loan rate policy responses were collapsed into two choices: continued government involvement (base loan rate on five-year average of market prices and raise loan rates) and less government involvement (lower loan rates). The statistical model correctly predicted about two-thirds of the responses.

Farmers with some college or technical school training prefer lower loan rates. As farmers become more educated and improve their management and marketing skills, they apparently think that government programs are less necessary to maintain a profitable business. Also, more educated farmers may better understand how lower loan rates help keep U.S. grain prices internationally competitive.

Grain farmers, including participants in the corn and wheat programs, prefer to continue current loan rates or raise them. However, livestock producers strongly favor a reduc-

tion in loan rates. This is likely due to their recognition that lower loan rates can reduce their feed costs.

Farmers Union members support higher loan rates. Farmers in the South prefer continued government intervention via loan rates. Also, farmers with greater dependence on off-farm income favor relatively high loan rates.

Dairy Policy. Less government intervention was defined as phasing out all dairy price supports, while continued government intervention included the current price support program, a production quota option, and greater authority for the Secretary of Agriculture to set dairy price supports. The model correctly predicted about two-thirds of the dairy policy preferences.

College educated and livestock farmers prefer a phaseout of the current dairy program. Dairy farmers, however, do not. Farmers Union members and farmers with greater dependence on off-farm income favor continued government intervention.

Crop Insurance. Crop insurance and disaster payments are controversial with special concern over associated budget costs and whether these programs effectively protect farmers from crop production risks. Information on farmers' socioeconomic characteristics predicted correctly 89 percent of their preferences of less versus continued government intervention via crop insurance and disaster programs.

Livestock farmers and farmers in the Midwest and Western states prefer the elimination of crop insurance and

Table 2. Influence of Socioeconomic Factors on U.S. Farmers Commodity and Trade Policy Preferences.^{ab/}

Socioeconomic Factors	General Policy			Target Price			Loan Rate			Dairy			Crop Insurance			Trade Barrier Reduction			Continue EEP			
	=/+	?	Less	=/+	?	Less	=/+	?	Less	=/+	?	Less	=/+	?	Less	=/+	?	Less	=/+	?	Less	
Age Over 50		X			X			X			X			X							X	
Sales > \$100,000		X			X			X			X					X			X			
College Education			X			X			X			X					X				X	
Off-farm Income > \$20,000	X			X			X			X			X			X					X	
Grain Farmer	X			X			X			X			X			X					X	
Livestock Farmer		X			X			X			X			X			X					X
In Wheat Program	X			X			X			X			X				X				X	
In Corn Program	X			X			X			X			X					X				X
Midwest		X			X			X			X			X			X					X
South	X				X			X			X			X			X					X
West		X			X			X			X			X			X					X
Farm Bureau		X			X			X			X			X				X				X
Farmers Union	X			X			X			X			X				X					X
Percent Predicated Correctly	67%			66%			65%			63%			89%			92%			80%			

a/ "=/+" implies continued government intervention and "less" implies less government intervention. "?" implies the socioeconomic variable is not statistically significant at the 0.05 probability level.

b/ For more detail on the statistical results see Shields.

disaster programs. However, larger farmers with annual gross sales over \$100,000, participants in the wheat and corn programs, and Farmers Union members favor continued government assistance.

Conservation Compliance. Conservation compliance is popular among many farmers (60 percent said yes). The statistical model correctly predicted the responses nearly three-fourths of the time. Continued government involvement was defined as favoring conservation compliance.

Grain producers, including both corn and wheat program participants, tend to disagree with the conservation compliance requirements of the 1985 Food Security Act. These results suggest that grain farmers may be concerned about the loss of program benefits if they do not comply with the conservation compliance requirements. Also, conservation compliance may increase production costs and reduce profits as they change tillage systems and crop rotations.

The level of education is a strong indicator of a farmer's attitude towards conservation compliance requirements. A farmer with college training tends to agree with the requirement. A higher level of education may contribute to a better understanding of the environmental advantages and long-run profit benefits from conservation practices. Also, more educated farmers may be better prepared to understand the rules and paperwork associated with conservation compliance.

Older farmers do not favor conservation compliance while younger farmers do. Younger farmers may more easily recognize the environmental benefits, be more willing and able to adjust their production practices, and stand to gain economically over time from the adoption of soil and water conservation practices.

The American Farm Bureau Federation and National Farmers Union both officially favor the conservation compliance requirements in the 1985 Food Security Act. Farm Bureau members support this view. However, the response from Farmers Union members contradicts the organization's official position.

Conservation Reserve Program. Continued government involvement included continuation or expansion of the CRP. Less government involvement was defined as elimination of the current program. The model's prediction accuracy for farmers' views on the Conservation Reserve Program (CRP) was 71 percent.

Farmers in the wheat and corn programs support the CRP, while livestock producers prefer the elimination of the CRP. From a livestock producer's perspective, the CRP removes land from production, potentially reducing feedgrain supplies and increasing their feed costs. Pasture land also may be reduced.

Farmers with larger gross sales support the continuation of the CRP. These farmers represent most of the land in annual acreage reduction programs as well as the CRP, and thus tend to receive a large share of total land retirement payments. By region and farm organization the statistical results were inconclusive.

Trade Barrier Reduction. About three-fourths of the respondents thought the United States should negotiate worldwide reductions in trade barriers. The statistical model

for this question correctly predicted 92 percent of the responses.

Farmers with a higher level of education strongly favor a reduction in international trade barriers. These farmers likely have a more global perspective, plus better management skills, that help them benefit from more competitive international markets.

Farmers with larger gross sales apparently expect to benefit from less trade restrictions since they support this policy option. Also, farmers participating in the corn program apparently anticipate economic advantages from a freer trade policy that offers greater access to foreign markets.

Farm Bureau members favor reductions in trade barriers while the results for Farmers Union members are inconclusive. The views of Farm Bureau members are consistent with that organization's more market-oriented philosophy.

Continuation of the EEP. The use of the EEP to regain lost market share has been supported by many farmers and policymakers during the last several years. Over one-half of the farmers agreed that the government should continue this policy. The model correctly predicted 80 percent of the EEP responses.

As expected, grain farmers and farmers participating in the wheat program are very supportive of this policy. Since 1985, EEP funds have subsidized about one-half of all U.S. wheat exports.

Table 3. Influence of Socioeconomic Factors on U.S. Farmers: Environmental Policy Preference.^{ab/}

Socioeconomic Factors	Conservation Compliance			Conservation Reserve Program		
	=/+	?	Less	=/+	?	Less
Age Over 50			X			X
Sales > \$100,000		X		X		
College Education	X				X	
Off-farm Income > \$20,000		X			X	
Grain Farmer		X			X	
Livestock Farmer		X				X
In Wheat Program			X	X		
In Corn Program		X		X		
Midwest		X			X	
South		X			X	
West		X				X
Farm Bureau		X			X	
Farmers' Union			X		X	
Percent Predicted Correctly	72%			71%		

a/ "=/+" implies continued government intervention and "less" implies less government intervention. "?" implies the socioeconomic variable is not statistically significant at the 0.05 probability level.

b/ For more detail on the statistical results see Shields.

Farmers with larger gross sales apparently believe they benefit from the program since they favor its continuation. Older farmers, however, appear to be more skeptical about the merits of the EEP and would rather see it discontinued.

Summary

This article reports results from a recent Purdue University study that identified several socioeconomic factors associated with U.S. farmers' preferences for selected agricultural and international trade policies. Using data from a 21-state survey and a statistical methodology called logit analysis, various hypotheses concerning farmers' policy preferences were analyzed. The empirical results offer objective, scientifically based information on farmers' policy preferences and their willingness to support various agricultural and trade policies in the 1990s.

In general, younger, college educated farmers, livestock producers, and Farm Bureau members favor less govern-

ment intervention in agricultural policy along with a reduction in international trade barriers. Grain farmers who participate in government programs and Farmers Union members are more likely to favor a continuation of current farm subsidy programs and more restrictive trade policies.

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Indiana Farm Operators Evaluate Community Services, Facilities, and Economic Conditions*

Freddie L. Barnard, Associate Professor

Public attention during the 1980's focused on the magnitude and severity of the financial hardships caused by the "farm crisis", and on the adjustments needed to address financial problems at the farm and lending institution levels. However, little scientific inquiry was directed at understanding the long-term consequences of the crisis on rural communities. The economic condition of a rural community is of particular concern, since it affects the ability of that community to provide services to residents and to farm families.

This article reports the results of a survey of Indiana farm families that was conducted as part of a larger study in the twelve North Central states. The survey was conducted by the departments of Agricultural Economics and Agricultural Statistics at Purdue University with funding from the North Central Regional Center for Rural Development. The results reported here are the opinions of Indiana farmers on community services, shopping and child care facilities, and economic conditions.

In February and early March 1989, 1400 Indiana farm operators were mailed a questionnaire. A total of 337 surveys were returned for a response rate of 24.1 percent. However, as noted in the summary table, the number of usable responses varied from question to question.

Opinions on Community Services, Facilities, and Economic Conditions

Farm operators were asked to evaluate community services, facilities, and economic conditions. The respondents indicated each had improved, stayed the same, or gotten worse over the past five years. Overall, the majority of respondents believed community services and facilities had either remained the same or improved. However, the respondents were not as positive about the economic conditions of farmers and agribusiness firms.

Services. More than 80 percent of the respondents felt each of the services evaluated had remained the same or improved (Table 1). Of particular interest is the evaluation of banking services. Senate Bill 1 was passed by the Indiana General Assembly in the spring of 1985. The legislation authorized cross-county branching for banks. At the time of passage there was concern about the availability of banking services to rural residents. Apparently the concerns about banking services did not materialize into a problem. Nearly 32 percent of the respondents felt banking services have actually improved over the past five years, compared to only about 15 percent who felt banking services had gotten worse.

One adjustment several farm operators and spouses made during the 1980s to deal with financial stress was to seek off-farm employment. In some instances, individuals needed additional training to prepare themselves for off-farm jobs. Respondents reported adult education opportunities generally improved during the period studied. Nearly 31 percent of the respondents felt adult education opportunities improved over the past five years, compared to only about five percent who felt those opportunities had gotten worse.

In general, farm operators felt the quality of schools improved or remained the same, but a substantial percentage felt the quality had deteriorated. More than 24 percent felt

**This research is in part a contribution to Regional Project NC-184, and supported in part by the North Central Regional Center for Rural Development. Thanks are extended to the farmers who completed the questionnaires; to Ralph W. Gann, Head of the Department of Agricultural Statistics at Purdue University, for helpful suggestions regarding design of the questionnaire and for supervising the collection of the survey data; and to Paul Lasley for coordinating the regional project. Helpful comments on earlier drafts of the manuscript by J.H. Atkinson, Professor, Janet S. Ayres and Christopher A. Hurt, Associate Professors, Department of Agricultural Economics at Purdue University are acknowledged.*

the quality of schools improved, whereas 17 percent felt the quality deteriorated. When this finding is combined with the fact that the United States is becoming increasingly involved in a rapidly changing, global economy and many farm operators and spouses work at off-farm jobs, a concern surfaces about the ability of graduates from schools in rural areas to compete for off-farm jobs.

Likewise, farm operators generally felt health-care services remained the same or improved, but a substantial percentage did indicate some concern about these services. More than 22 percent felt health-care services improved, but more than 16 percent felt those services had gotten worse. This concern may be the result of difficulties experienced in some rural communities in providing health-care services. Respondents may also be concerned about long-term health care for the elderly. Since 58 percent of the operators are 50 years of age or older and nearly 20 percent are 65 or older, they may be concerned about family members who require such care or concerned about their own care. Respondents did not specify which aspects of health-care services concerned them, but their concerns likely relate to availability, quality, and cost.

Respondents generally felt police and fire protection remained the same. The same opinion was expressed about opportunities for entertainment and recreation.

Facilities. Sixty-one percent of the respondents felt shopping facilities had improved, and only 11 percent felt those facilities had gotten worse. However, a much lower percentage (16 percent) felt child care facilities had improved. Although only about three percent felt those facilities had gotten worse, nearly 21 percent were uncertain. It should be

noted the respondents to this question were operators, and 58 percent of those operators were 50 years of age or older. They may not be as familiar with child care facilities as their spouses. This may explain why 21 percent were uncertain about the facilities. Since many farm spouses work off the farm, there may be an increase in the demand for child care facilities in future years. Hence, this area needs further study.

Economic Conditions. A common adjustment made by some farm operators and spouses during the 1980s was to seek off-farm employment. A concern among community leaders, counselors, academicians, legislators, and others was the availability of off-farm jobs within commuting distances for those individuals. Nearly 36 percent of the respondents felt job opportunities had improved, which is an encouraging result. However, off-farm job opportunities are still not at an acceptable level, because 29 percent of the respondents felt off-farm job opportunities had gotten worse. Additional research is needed in this area to determine ways to diversify and more fully develop rural communities in Indiana.

Opinions on the financial condition of Hoosier farmers continue to vary widely. Nearly 49 percent of the respondents felt the financial condition of their own farm had remained the same. Over 27 percent felt their financial condition had gotten worse, compared to nearly 24 percent who felt their financial condition had improved.

Although nearly one-fourth of the respondents felt the financial condition of their own farm had improved, respondents were not as positive about the economic condition of all farmers and agribusiness firms. Over 51 percent of the

Table 1. Farm operators' opinions on local services, facilities, and economic conditions from 1984 to 1989.

	Improved	Remained the Same	Gotten Worse	Uncertain	Not Available	No. of Respondents
	-----Percent-----					
Services:						
Banking services	31.7	51.5	14.7	1.8	0.3	334
Adult education opportunities	30.7	52.3	4.6	10.9	1.5	329
Quality of schools	24.3	53.5	17.0	4.6	0.6	329
Health care services	22.5	54.4	16.5	5.7	0.9	333
Police and fire protection	18.9	75.4	3.6	1.2	0.9	333
Opportunities for entertainment and recreation	21.0	60.4	12.6	4.5	1.5	333
Facilities:						
Shopping facilities	61.0	26.7	11.1	0.9	0.3	333
Child care facilities	15.7	55.1	3.4	20.9	5.0	325
Economic Conditions:						
Job opportunities	35.7	29.7	29.1	3.9	1.5	333
Your farm's financial condition	23.8	48.8	27.1	0.3	NA	328
Current financial condition of farmers	15.0	28.1	51.8	4.5	0.6	334
Current financial condition of agribusiness firms	11.8	29.6	49.8	7.9	0.9	331
Current financial condition of lenders in your area	17.3	48.2	19.7	13.3	1.5	330

Note: NA = Not applicable.

respondents felt the current financial condition of all farmers had gotten worse. Only 15 percent felt the financial condition had improved. Since the financial condition of agribusiness firms depends on the financial condition of farmers, it is not surprising to find a similar attitude about agribusiness firms. Nearly 50 percent felt the current financial condition of agribusiness firms had gotten worse.

In general, respondents felt the financial condition of lenders had remained the same (48.2 percent). Only a slightly higher percentage felt the financial condition of lenders had gotten worse (19.7 percent) than felt it had improved (17.3 percent). The percentage who felt the financial condition of lenders had gotten worse is surprisingly low considering the well-publicized problems of the Farm Credit System, Farmers Home Administration, and the savings and loan industry.

Characteristics of Respondents

Age and Education. The average age of operators was 52.1 years. The average age of farm spouses was 49.7 years. Nearly 20 percent of the operators and about 13 percent of the spouses were 65 years of age or older. The average number of years of education for operators and spouses was 12.5 years. More than two-thirds of the operators and spouses have completed 9-12 years of formal education, and over one-fourth have gone on for post-secondary education.

Acres Farmed and Gross Farm Sales. The farm size reported by respondents is larger, in terms of acres farmed

and gross farm sales, than reported in the 1987 Census. The average farm size of survey respondents, 489 acres, is more than double the size reported in the Census, 229 acres. Likewise, a higher percentage of respondents had gross farm incomes of \$100,000 or more (26 percent) than was reported in the Census (15.5 percent). Therefore, the results from this survey are biased toward operators and spouses of larger farm operations.

Conclusion

This report summarizes data collected from a random sample of Indiana farm families. Respondents were asked to evaluate, over the past five years, the services, facilities, and economic conditions in their communities.

The results from this survey indicate there are at least three issues relating to services and facilities in rural communities that should be addressed by state leaders. The first issue is the availability of off-farm jobs. A related issue is the availability and quality of child care facilities. This issue will continue to be important in the 1990s as a greater number of farmers and spouses work off the farm. The second issue is the quality of schools. Students who attend schools in rural areas must receive a quality education to compete successfully in the high-tech, competitive economic environment of the 1990s. The third issue is the availability, quality, and cost of health-care services. This is particularly important for the elderly.

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