ORGANIC FEED FOR POULTRY & LIVESTOCK: AVAILABILITY AND PRICES

1. Introduction

This study is the result of two actions taken by Congress in 2002 and 2003. First, managers' report language in the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill) urged the Secretary of Agriculture to undertake a study to ascertain the availability of organically produced feed for the organic production of livestock and poultry.

Second, the Omnibus Appropriations Act of 2003 (FY03 appropriations bill) contains language prohibiting U. S. Department of Agriculture (USDA) enforcement of the National Organic Program (NOP) requirement that organic livestock and poultry must be fed from organic feed sources only, unless USDA can show that feed needed by organic producers is both available and not more than double the price of feed for conventional livestock and poultry production.

Prior to completion of this study in Spring 2003, Congress passed the Emergency Wartime Supplemental Appropriations Act of 2003, P.L. 108-11. This legislation included a provision that repealed the organic feed price language in the FY03 appropriations bill. Given the interest in organic feed prices compared with prices for conventional feed grains, this study includes such a comparative analysis.

This study reviews acreage trends from 1997-2001, and projected acreage to 2004 based on surveys. Based on acreage and yield data, potential organic feed production and availability for animal agriculture are estimated. Prices and premiums for organic feed rations used for broiler production are examined for

the recent past and for conditions during Spring 2003. In addition, regional production patterns are examined to explore any significant differences between conventional and organic production patterns that may affect feed availability for livestock producers. Where assumptions are made (such as yields, prices, and share of grain used for feed), the most conservative estimate of the particular variable was selected, in order to avoid overly optimistic estimates of organic feed availability or organic feed prices relative to conventional feed prices.

Data used in this study are from USDA reports from the following sources: the Agricultural Marketing Service (AMS), the Economic Research Service (ERS), the National Agricultural Statistics Service (NASS), and the World Agricultural Outlook Board (WAOB). Survey data on projected acreage come from Iowa State University, North Carolina State University, and Cornell University[1]. Past price data are from ERS and the WAOB, and current price data were obtained from grain dealers who trade in both organic and conventional grain as well as grain buyers, including livestock producers.

Projections of organic acreage for 2002-2004 are based on surveys conducted at AMS' request by Iowa State University, North Carolina State University, and Cornell University, and extrapolated based on ERS estimates for 2001. Surveys of producers and buyers requested information on their expected future acreage, by feed grain, for the years 2002-2004. Questionnaires were sent to by these three land grant universities to 1,474 farmers in 29 States; 525 responses were received from 17 states, with 359 considered useable based on

[1] A fourth cooperator's results (University of California at Davis) were received late and were not used in this study; data from this cooperator's surveys showed insignificant acreage committed to organic corn or soybean production.

grain questions answered. Another 83 dealers (grain buyers) were also queried, with 40 useable responses received.

2. U.S. Organic Corn and Soybean Acreage

2001 Acreage -- According to ERS, an estimated 93,553 acres were planted to certified organic corn and 174,467 acres were planted to certified organic soybeans in 2001. ERS estimates are based on contacts with 53 certification groups that provided certification services during 1997 through 2001.

Compared with ERS estimates from 1997, the acreage reported in 2001 had more than doubled. Corn acreage rose from about 43,000 acres to over 93,000 acres, while organic soybean acreage rose from 82,000 acres to over 174,000 acres.

Despite this impressive growth in acreage, organic corn and soybean acres are a small fraction of the total U.S. conventional corn and soybean acreage. In 2001/02, USDA estimated that 149.9 million acres were planted to corn and soybeans combined. Thus, organic corn and soybean acreage totaling 268,020 acres represented about 0.2 percent of total U.S. corn and soybean acreage.

2002 -2004 Acreage – USDA does not have official data and projections for organic production. Thus organic acreage for 2002-2004 is projected based on the surveys conducted by the land grant universities, and extrapolated based on the results of the ERS estimates for 2001.

Comparing the survey results to the actual numbers reported by ERS for 2001, and extrapolating the responses based on the ERS report, an estimated 96,662 acres would have been planted to organic corn in 2002, rising to 112,000 acres in 2003 and 141,962 acres by 2004 (table 1). Future organic soybean

acreage based on survey responses are estimated at 200,046 acres in 2002, rising to 241,560 in 2003 and 508,823 acres by 2004. (The large increase in 2004 soybean acreage also reflects contracts for acreage reported by buyers. Appendix 1 shows actual reported acreage by states from ERS and the land grant university survey data to determine future estimates of organic acreage.)

Table 1. Organic corn and soybean acreage, 2001-2004[1/]

Organic Acres	2001	2002	2003	2004
Corn	93,553	96,662	112,000	141,962
Soybeans	174,467	200,046	241,560	508,823
Total	268,020	296,708	353,560	650,785

[1] 2001 estimates based on ERS reported acreage in 48 states by 53 certification groups; 2002-04 acreage reported by surveys, extrapolated to correspond to ERS reported state acreage.

3. Organic Corn and Soybean Production

At present, USDA does not collect or report data for organic grain production and use. Only conventional grain production estimates are reported in USDA's monthly World Agricultural Supply and Demand Estimates (WASDE) report. In this study, USDA average yield estimates are used to develop potential organic feed grain production, since nearly all organic producers contacted report that they achieve yields comparable to conventional yields. (Some respondents reported higher yields—e.g., 140 bushels per acre for organic corn, while others report achieving at least 95 percent of conventional yields.)

For the 2001 crops, U.S. average yields were 39.6 bushels per acre for soybeans, and 138.2 bushels per acre for corn. Using these yields, 2001 organic

corn production is estimated at 12.9 million bushels and organic soybean production at 6.9 million bushels (table 3).

In 2002, due to widespread drought, USDA lowered yield estimates to 37.8 bushels for soybeans and 130 bushels for corn. However, some survey respondents reported lower yields than USDA's estimates (some as low as 100 bushels for corn and 30 bushels for soybeans). Therefore, an average between respondents' and USDA's lower yield estimates for 2002 was used to derive a conservative production estimate. Thus, for 2002 the estimated yields were lowered to 115 bushels for organic corn and 34 bushels for organic soybeans. These lower yields result in an estimated 11.1 million bushel organic corn crop and a 6.8 million bushel organic soybean crop for 2002 using the acreages reported in table 1.

For 2003 and 2004, USDA estimated average yields for the 2002/03 crops are used. Organic corn production in 2003 could be 14.6 million bushels, rising to 18.5 million bushels in 2004. Organic soybean production in 2003 could be 9.1 million bushels, rising to 19.2 million bushels in 2004.

Table 2. Organic corn and soybean production, 2001-2004

Grain	2001*	2002**	2003**	2004**
Corn acres	93,553	96,662	112,000	141,962
Yield/acre***	138.2	115.0	130.0	130.0
Production (mil bu)	12.93	11.12	14.56	18.46
Soybean acres	174,467	200,046	241,560	508,823
Yield/acre***	39.6	34.0	37.8	37.8
Production (mil bu)	6.91	6.80	9.13	19.23

*--ERS reported acreage in all 48 states by 53 certification groups.
**--Acreage reported by surveys, extrapolated to correspond to ERS reported state acreage.
***--Based on USDA reported and estimated yields for 2001, 2003-04. Average of USDA and survey yields used for 2002.

4. Feed for Livestock & Poultry

A considerable amount of feed grain production goes to non-feed uses: food, seed, and industrial uses (such as ethanol, from which byproducts are often diverted to feed). Based on historical averages, 72 percent of production is used as an estimate for feed use of corn. For soybeans, domestic feed use generally comprises 60 percent of total soybean production in the United States[2].

Using the above estimates of 72 percent of corn production and 60 percent of soybean production going to feed use, the total available organic corn for animal feed is placed at 9.3 million bushels in 2001, 8 million in 2002, 10.5 million in 2003, and 13.3 million in 2004 (table 3). For organic soybeans, 4.2 million bushels would have been available for feed use in 2001 and 4.1 million in 2002. In 2003, 5.5 million bushels could be available for organic feed use, and for 2004, 11.5 million bushels.

Available feed grains are also shared among all livestock and poultry, and USDA publishes data on the average amounts of grain consumed by animal species. Broiler production in the United States has typically consumed 11 percent of all feed fed to livestock and poultry. Thus, the estimate of total available feed can be further refined to indicate an expected share of feed available for supporting an organic broiler industry. This would result in 1 million bushels of organic corn for broilers in 2001, 0.8 million bushels in 2002, 1.2 million bushels in 2003, and 1.5 million bushels in 2004 (table 3). Organic soybeans available for organic broiler production would have been 0.5 million

[2] Using these estimates understates the amount of organic corn that would go to feed use, because it is highly unlikely that organic corn would be used in ethanol production, so more would be available for feed use. To be conservative, however, in assuring sufficient corn available for organic feed use, the conventional feed use share is used. And although tofu is likely a larger proportion of organic soybean use than in conventional soybean uses, the varieties are different; thus, soybeans for feed are assumed to be used in similar proportions for both organic and conventional soybeans.

bushels in 2001, 0.4 million bushels in 2002, 0.6 million bushels in 2003, and 1.3 million bushels in 2004.

These feed availability estimates represent lower bounds based on the conservative yield assumptions and the 11 percent of feed typically used in conventional broiler production. Organic poultry producers could, of course, claim more of the available feed, depending on market conditions. A greater demand for organic poultry by consumers compared to demand for other organic meats would encourage producers to bid more grain away from competing uses. Theoretically, the maximum feed available for organic broiler production is the total feed available as reported in table 3. This also gives an upper bound on the potential size of the organic broiler industry.

5. Organic Broiler Production

How many organic broilers could be raised using these available organic feed grain estimates? Based on confirmations among livestock and poultry analysts in USDA as well as industry nutritionists, a broiler typically requires approximately 11.4 pounds of feed, in a 68:32 ratio of corn to soybean meal. (Some industry analysts also use a 2:1 corn-soybean ratio to estimate total needs for broilers.)

A bushel of corn weighs 56 pounds; a bushel of soybeans weighs 60 pounds. Of the 11.4 pounds of feed required, approximately 0.14 bushels of organic corn and about 0.06 bushels of organic soybeans are needed to feed an average broiler. Taking the total bushels previously estimated to be available for broiler production, and dividing by 0.14 bushels of corn and 0.06 bushels of soybeans provides a range of estimated broiler production. Table 3 shows a

range of broiler production potential, based on feed availability. The upper end of the range estimates broiler production potential if all feed were diverted to broiler production. The lower end of the range reflects historical use of 11 percent of feed claimed by broiler production.

In 2001, 1 million bushels of organic corn for broiler production would have fed 7.3 million organic broilers; 0.5 million bushels of organic soybean production available for broilers would have fed 7.6 million broilers. Since both corn and soybeans are needed for a feed ration for broilers, whichever feed is in shorter supply dictates the upper bound of broilers that could be raised. Therefore, in 2001, 7.3 million broilers would have been the limit that could be produced using a standard 68:32 ratio of corn to soybeans (table 3).

According to ERS, there were approximately 3.3 million broilers produced under organic management practices in 2001. Thus, even in 2001, there should have been ample feed grains available for organic broiler production.

In 2002, based on historical usage of feed grains, there could have been 5.5 million organic broilers raised, given the limiting grain was corn (the organic soybeans available could have supported 6.7 million organic broilers). For 2003, corn is also the projected limiting feed – the organic corn that could be used for broiler production would feed 8.2 million broilers, while the organic soybean crop would support 10 million broilers. By 2004, corn is again the limiting feed in a total feed ration for organic broilers. Organic corn available would support 10.4 million broilers, while organic soybean production available for broiler feed would support 21 million broilers.

Table 3. -- Organic Broiler Production Potential

Production	Unit	2001	2002	2003	2004
Corn feed	(mil bu)[1]	9.3	6.8	10.5	13.3
11% feed use	(mil bu)	1.0	0.8	1.2	1.5
Broilers	(mil birds)[2]	7.3	5.3	8.2	10.4
100% feed use	(mil bu)	9.3	6.8	10.5	13.3
Broilers	(mil birds)[2]	66.4	48.6	75.0	95.0
Soybean feed	(mil bu)[1]	4.2	3.6	5.5	11.5
11% feed use	(mil bu)	0.5	0.4	0.6	1.3
Broilers	(mil birds)[2]	7.6	6.7	10.0	21.2
100% feed use	(mil bu)	4.2	3.6	5.5	11.5
Broilers	(mil birds)[2]	70.0	60.0	71.7	191.8
Broiler Potential					
11% feed use	(mil birds)[3]	7.3	5.3	8.2	10.4
100% feed use	(mil birds)[3]	66.4	48.6	71.7	95.0

[1]--Based on 72 percent corn used for feed and 60 percent soybeans used for feed.
[2]--Broilers based on .14 bu. of corn needed; or based on .06 bu. of soybeans needed per bird.
[3]--Broilers possible based on the limiting supply of feed grains in a ration.

6. Other Organic Livestock Production

Table 3 shows a range of broilers that could be raised, assuming poultry producers used at least 11 percent of the organic feed available, and depending on market conditions, up to 100 percent of the feed available. However, it is unlikely that all of the feed would be used just for organic broilers – there is a growing organic dairy industry, and organic livestock production is also emerging, although not at the pace of organic dairy production.

The managers' report language accompanying the 2002 Farm Bill also asked about potential organic production of other livestock as well. Therefore, after accounting for broiler production based on 11 percent of available organic feed, the number of organic beef and dairy cattle that were certified in 2001 are

examined to estimate whether sufficient grain is available to meet the needs of producers of organic beef and dairy products.

One significant difference between organic broiler and organic dairy and beef production is that ruminants must be fed on pasture in an organic system. Ruminants cannot be fed entirely from grain (nor would they necessarily be even in a conventional operation).

According to ERS, at the end of 2001 there were just over 15,000 head of organic beef cattle and nearly 49,000 dairy cows certified as organic. Organic beef cattle would consume roughly the equivalent amounts of feed as conventional, assuming they are grass or range-fed for similar parts of the year and finished with grain.

Using USDA's feed consumption numbers per head, beef cattle would require approximately 108 bushels of feed (corn-equivalent basis), in either an organic or conventional operation. Organic dairy cattle, however, consume less grain because they spend more time on pasture than in conventional operations. A conventional, commercial dairy cow consumes 232 bushels of feed while an organic dairy cow consumes approximately 175 bushels of feed (corn-equivalent basis). In total, on a corn-equivalent basis, the beef and dairy cattle that were certified as organic at the end of 2001 would have required approximately 10.2 million bushels of feed.

After accounting for the 1 million bushels of corn that could have gone to broiler production in 2001 to produce 7.3 million broilers, there would still have been over 8 million bushels of corn to meet the nutritional energy needs for beef and dairy cattle (9 million bushels of corn for feed minus 1 million used in broiler

production). And there would have been over 3.5 million bushels of soybeans available to supply protein needs for beef and dairy cattle.

The amount and types of grain consumed by beef and dairy cattle, however, depend on relative prices of the source of grain and nutritional contribution to the diet, e.g., protein or energy. Although we calculate 10.2 million bushels on a corn-equivalent basis, cattle may be fed protein from many other sources to supplement the energy requirements obtained just from corn. Thus, in addition to corn and soybeans, dairy and beef cattle can also be fed from several other grain sources, depending on price, availability, and nutritional content needed.

At the end of 2001, in addition to acres planted to corn and soybeans, ERS also reported 341,704 acres of organic wheat, oats, barley, sorghum, rice, spelt, millet, buckwheat, and rye; nearly 36,000 acres of organic flax and sunflowers, and 253,641 acres of all types of organic hay and silage. Even if all of the remaining 8 million bushels of organic feed corn were used for organic beef and dairy cattle in 2001, the additional 2.2 million bushels of grain needed to support those levels of organic livestock production could have been easily obtained from the additional sources of grain reported available at that time. The soybean crop alone could have met that protein source requirement, but so could many other grains.

Also, recall that ERS reported organic broiler production in 2001 at 3.3 million broilers, not the potential market of 7.3 million broilers that could have been produced based on the estimated amount of feed available. Given expected growth in acreage derived from the survey responses received, it is reasonable to assume that just as organic broiler production could expand with greater feed

availability, there is room to accommodate growth in other organic livestock production as well.

On a related note, feed supplies for the Southeastern States[3] are typically drawn from other States. The Southeastern States are the major broiler producers – raising nearly 5 billion broilers, or about 60 percent of total U.S. broiler production (figure 1). In addition, these States raise approximately 9 percent of all U.S. dairy cattle. But these States produce less than 6 percent of all corn and around 7.6 percent of all soybeans produced in the country. Broiler and dairy production in the Southeastern States, based on the numbers above, would have required nearly 900 million bushels of corn alone. Since these States produced around 540 million bushels of corn, they would need to import around 40 percent of corn needed to fulfill feeding requirements.

7. Regional Production Patterns

Regional patterns of feed grain production for organic corn and organic soybeans were also examined to see whether regional organic feed availability differs significantly from conventional feed production. In addition, feed needs are examined based on regional livestock and poultry production, with a particular focus on grain-deficit areas. Not unexpectedly, regional patterns of organic feed production are fairly similar to patterns of conventional feed production (table 4). Thus, livestock and poultry producers in grain-deficit regions appear to face similar market challenges in acquiring organic feed as conventional feed. Basic transportation and other location cost factors facing

[3] Southeastern States include Alabama, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. Arkansas, Louisiana, Texas and Oklahoma are excluded.

buyers and sellers might, therefore, be set aside in comparing prices for organic and conventional feed rations.

In Midwestern States[4], organic corn and soybean acres each represented 86 percent of U.S. certified organic corn and soybean acreage in 2001 (figure 1). According to NASS, in 2001 these states planted 83.5 percent of conventional corn acres and 84.2 percent of conventional soybean acres.

Northeastern States[5] planted nearly 6 percent of organic corn and 4 percent of all conventional corn in 2001; these states planted 3 percent of organic soybean acres and 1.2 percent of all conventional soybean acres.

The South is typically a grain deficit region, a pattern seen in both organic production as well as conventional grain production. Southern states[6] (including both states in the Southeast and South Central regions) accounted for 4 percent of organic corn acres, but 9 percent of conventional corn acres; Southern states accounted for 10 percent of organic soybean acres and 14.6 percent of conventional soybean acres planted in 2001.

Western states[7] accounted for about 4 percent of ERS' reported organic corn acres in 2001, and 3.2 percent of all conventional corn acres reported by NASS in 2001. The Western states are not typically soybean-producing states,

[4] Midwestern States in this study include: Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, North Dakota, Oklahoma, South Dakota, and Wisconsin.
[5] Northeastern States in this study include: Connecticut, Delaware, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.
[6] See footnote 3 above.
[7] Western States in this study include: Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming. Alaska and Hawaii are excluded from the study and surveys conducted.

although some states reported a small amount of organic soybean acres planted in 2001, about 0.4 percent of all reported organic soybean acreage.

Table 4. Conventional & organic corn and soybean acreage[1] by region, 2001

Conventional Acreage

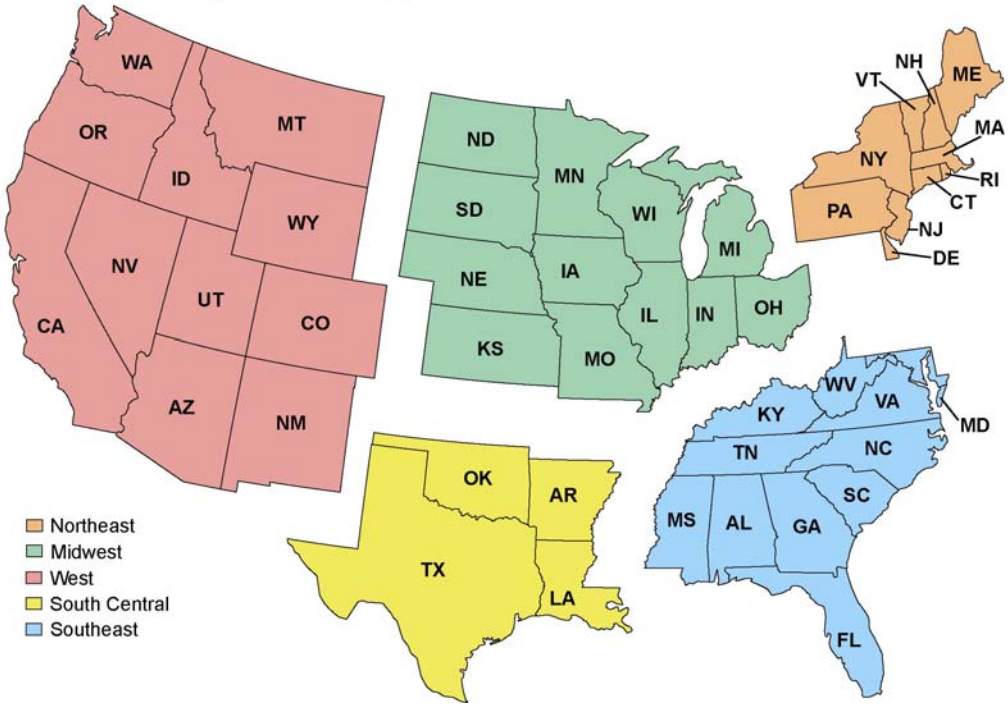
Grain	Midwest	South	Northeast	West
		--- million acres ---		
Corn	62.23	7.12	2.97	2.44
Soybeans	62.35	10.86	0.87	--
Total	125.58	17.97	3.84	2.44

Organic Acreage

Grain	Midwest	South	Northeast	West
		--- acres ---		
Corn	80,655	3,727	5,346	3,825
Soybeans	150,435	18,067	5,240	720
Total	231,090	21,794	10,586	4,545

[1]—See previous footnotes for states included in each region.

Figure 1. Regional Feed Grain Production



<u>Conventional corn production (2001):</u> 76 million acres; 9.5 billion bushels

- Northeast—3 mil acres (4% of U.S.); 185 mil bu (2% of U.S.)
- Midwest – 63.2 mil acres (83% of U.S.); 8.3 bil bu (87% of U.S.)
- West – 2.4 mil acres (3.2% of U.S.); 221 mil bu (2% of U.S.)
- South – 7.1 mil acres (9.4% of U.S.); 805 mil bu (9% of U.S.)
  - South Central – 2.4 mil acres (3.2% of U.S.); 266 mil bu (3% of U.S.)
  - Southeast – 4.7 mil acres (6.2% of U.S.); 539 mil bu (6% of U.S.)

<u>Conventional soybean production (2001):</u> 74 million acres; 2.9 billion bushels

- Northeast—868,000 acres (1.2% of U.S.); 30 mil bu (1% of U.S.)
- Midwest – 62.6 mil acres (84.6% of U.S.); 2.5 bil bu (86% of U.S.)
- West – 0 acres; 0 bushels (0%)
- South – 10.8 mil acres (14.6% of U.S.); 244 mil bu (8% of U.S.)
  - South Central – 4.2 mil acres (5.7% of U.S.); 122 mil bu (4% of U.S.)
  - Southeast – 6.6 mil acres (8.9% of U.S.); 120 mil bu (4% of U.S.)

8. Organic Feed Prices

Although USDA does not publish organic commodity prices in its official agricultural price reports, there have been some outside studies as well as research conducted by ERS to examine prices received by farmers, and prices at various other stages of the marketing chain for organic raw and processed commodities. Prices vary regionally, but more importantly, prices for organic

commodities vary by end use. Typically, organic prices for raw or processed food products for consumers tend to be relatively higher than organic prices charged for commodities used as inputs in other products or for feed uses.

Limited price reporting of organic commodities exists, but as growth continues in the industry this is likely to change. One private price reporting firm collects organic price data, and publishes monthly prices for a variety of organic products. No state prices are quoted, nor are prices quoted in a composite standard feed ration for broilers. Prices reported are spot prices from dealers and farm sources for organic corn and clear hilum (food grade) soybeans. Food grade soybeans trade at a considerably higher price than feed grade soybeans. Their market is driven by a strong demand by both Japanese and domestic buyers for the clear hilum characteristic when the beans are separated and processed into tofu.

Thus, a feed ration constructed using food grade soybeans will result in artificially higher prices than actually paid by feeders, who look for cheaper protein sources. Most industry analysts report that feed grade soybeans trade at 20 percent discount to higher quality food grade soybeans.

Several feed dealers in the United States were contacted to find out what they pay for both conventional and organic feed for broilers. Prices are quoted per ton for a feed ration based on a 2:1 ratio of corn to soybeans to develop a 20-percent protein feed for broilers. (This actually results in a slightly higher price than if the 68:32 ratio is used, but ensures that the organic price premium is not understated relative to conventional prices for feed rations).

Tables 5-7 show prices of a conventional feed ration and the prices for a similar organic feed ration. Although organic feed prices for broilers are indeed

higher than prices for conventional feed for broilers, in most cases, they are not more than double the price of conventional feed.

One important point concerns the use of conventional feed in place of organic feed. Even if organic livestock producers were statutorily permitted to use non-organic feed sources for their livestock needs, the National Organic Standards prohibit the use of feed grains from genetically-modified (GMO) sources. This is a separate standard from the livestock feeding requirements specified in the NOP regulations.

Therefore, even if producers could use non-organic feed, they would be required to procure grain from identity-preserved grain sources to ensure it is produced from non-GMO seed, had not been subject to pollen drift, and was not commingled with GMO corn or soybeans after harvest. According to NASS, approximately 66 percent of the U.S. corn crop in 2002 was non-GMO corn, and around 30 percent of the U.S. soybean crop was non-GMO.

Identity-preserved non-GMO grain for feed also would be higher in price than conventional feed not subject to identity preservation requirements. Although USDA official prices for corn and soybeans as reported in the Department's World Agricultural Supply and Demand Estimates (WASDE) report are used here to represent conventional grain prices, this point about higher priced, identity-preserved corn and soybeans should be kept in mind when comparing organic and conventional feed prices. Depending on the price premiums that would be required to acquire grain from non-GMO sources, the price gap between organic and non-GMO feed would narrow. Thus, a feed ration cost constructed from a higher priced non-GMO corn and soybean ration using a

10 percent premium for IP-corn and 16 percent premium for IP-soybeans was developed, based on estimates reported by ERS.

Four firms that were contacted submitted only the total feed ration prices they quoted, both for organic and conventional broiler feeds, without a breakdown for corn and soybeans. Their prices paid for organic and conventional feeds are shown in table 5.

Table 6 provides price information for conventional and organic corn and soybeans and a typical ration for broilers, based on 2002 price projections from USDA and prices submitted for recent trades by grain dealers for corn and soybeans. The feed ration prices in the table are constructed from prices using the 2:1 ratio of corn to soybeans, for both organic and conventional feed. One large feed mill operation in the Southeast reported orally that its organic feed ration is approximately $258 per ton, compared with a conventional feed ration of around $133 per ton, and reported that they source nearly all of their grain from the Midwestern States of Ohio, Minnesota, and Iowa; they also ship finished feeds as far south as Tampa, Florida (with no written price confirmation submitted, their numbers were omitted from the tables on the following pages).

The second to the last column shows the ratio of organic feed relative to conventional feed. A ratio of 3.00 means that the organic feed is 3 times the cost of conventional feed, while a ratio of 1.57 means that organic feed is 57 percent higher than conventional feed. Of the 15 price observations reported in table 6, two quotes are more than double the price of conventional feed, one is exactly twice the price of conventional feed; the remaining 12 (80 percent) are less than double the prices for conventional feed.

The last column shows the premium of organic feed compared to a 10-16 percent premium for identity preserved non-GMO grain. When a premium is added for identity preserved conventional feed, only two of the organic price observations are double or more than double the price of identity-preserved feed rations.

Table 7 examines prices in each of the States that reported organic feed prices to AMS. While table 6 compared organic price quotes to the U.S. average price estimated for 2002/03 corn and soybeans, we also wanted to examine differences in prices paid by State. However, state prices were not yet published at the time of this study for the 2002/03 crop year. The 2002/03 national average prices for corn and soybeans were 19 (corn) and 16.4 (soybean) percent higher than national average prices reported for 2001/02. Therefore, we calculated 2002/03 State prices by adjusting reported 2001/02 state prices upward by 19 percent for corn and 16.4 percent for soybeans, to develop estimated 2002/03 State prices. A feed ration price for conventional grain was then calculated, using the 2:1 ratio for corn and soybeans.

We then compared these estimated conventional feed ration prices to the organic feed ration prices that were reported to AMS by grain dealers in each of those States, and developed the premiums shown in the far right column of table 7. Four of the 19 price observations were more than double the prices for conventional feed, based on estimated State prices. Pennsylvania pays the highest premium, at 2.18 times the price for conventional feed in that State, followed by North Carolina at 2.09 times the price of conventional feed. Conventional grain prices are also relatively higher (compared to national

average farm prices) in both of these States, perhaps reflecting costs of production and opportunity costs for alternative uses for land.

Table 5. Comparison of conventional and organic feed ration costs[1]

Organic Firm Location:		Conventional feed ration	Organic feed ration	Ratio: Organic to conventional
		$/ton	$/ton	
California	(buyer)	194	361	1.86
Wisconsin	(seller)	225	333	1.48
Oregon	(seller)	338	499	1.47
Vermont	(seller)	202	376	1.90

1 - These prices are for finished feeds rather than rations based just on grain inputs. Finished feed costs also include any additional supplements added to feeds, plus labor and milling costs.

9. Conclusions

Two conclusions are evident from this study. First, ample acreage is available to provide more than enough feed grains to meet the needs of organic livestock and broiler producers. Acreage in 2001 would have supported an organic broiler industry at twice the levels of production that were reported by ERS in 2001, in addition to the levels of beef and dairy cattle that were certified as organic that year. Surveys of producers and buyers willing to contract for acreage show that in 2003, the broiler industry could grow to 150 percent of 2001 levels, and by 2004, could more than triple compared with 2001 production.

Second, with limited exceptions, particularly if identity-preserved grain premiums are included, prices for organic poultry rations are not more than twice the prices of conventional poultry feed rations. Even when variations in State prices are included, just 4 of the 19 price observations for organic feed rations are more than double the prices for conventional feed rations, not considering price premiums that would likely occur for identity-preserved conventional grain.

Table 6. State organic feed prices and U.S. average conventional and IP non-GMO feed prices.

Grain/Source		Corn	Soybeans	Feed Ration[1]	Organic/ Conv. feed	Organic/ IP non-GMO
		$/ton	$/ton	$/ton	---ratio---	
Conventional grain:						
USDA-WASDE (1/03)		84	170	113		
Est. IP grain premium[2]		97	187	117		
Organic grain dealers:						
(exc. freight):						
Washington[3]	buyer)	120	350[2]	197	1.74	1.68
NE Iowa	(seller)	170	267	202	1.78	1.73
SE Minnesota	(seller)	161	267	202	1.78	1.73
So. Dakota	(seller)	152	267	202	1.78	1.73
WC Minnesota	(seller)	161	267	202	1.78	1.73
NE Ohio	(buyer)	152	300	201	1.78	1.72
Michigan	(seller)	144	366	218	1.93	1.86
Iowa	(seller)	130	275	178	1.57	1.52
Missouri	(seller)	166	350	227	2.00	1.94
Illinois	(seller)	134	300	189	1.67	1.61
Pennsylvania	(seller)	155	484	264	2.33	2.25
Minnesota	(seller)	134	400	222	1.96	1.90
Price reporting firm[4]		108	328	181	1.60	1.55
Price reporting firm[4]		108	409	208	1.84	1.78
North Carolina	(buyer)	166	440	257	2.27	2.20

Notes:

1 – Feed ration is computed using a 2:1 corn to soybean ratio. Thus, from Illinois, the ration price is calculated as 2/3 of corn price per ton + 1/3 of soybean price per ton = $134 * 2/3 + $300/3 or $189/ton.

2 – IP corn and soybean premiums, estimated by ERS, added 10% to soybean prices and 16% to corn prices at the farm, to cover incentives to grow and segregate (handle) identity preserved grains. Additional shipping costs were found to be insignificant for sufficiently large volumes.

3 – Washington dealer quoted a price including full-fat soybeans at $500/ton (oil and meal included). Broiler rations only require the meal, while layers might use the oil in a cooked bean product. This is about 1/3 higher than the standard soybean meal used in a broiler feed. Excluding the value of the oil, the meal price would have been around $350/ton excluding freight.

4 – Prices from private reporting service, 12-month averages for 2002. The first quote discounts food grade soybean prices by 20 percent to estimate a feed grade ration price. The second quote uses the higher food grade soybean price reported by the service.

Table 7. Selected state conventional and organic feed prices[1], 2002/03

State		Conventional Feed[2]	Organic Feed[2]	Ratio of organic to conventional
		$/ton	$/ton	---ratio---
Washington[3]	(buyer)	130	197	1.51
NE Iowa	(seller)	110	202	1.84
SE Minnesota	(seller)	110	202	1.84
South Dakota	(seller)	102	202	1.98
Minnesota	(seller)	110	202	1.84
NE Ohio	(buyer)	115	201	1.75
Michigan	(seller)	114	218	1.91
Iowa	(seller)	110	178	1.62
Missouri	(seller)	111	227	2.04
Illinois	(seller)	117	189	1.61
Pennsylvania	(seller)	121	264	2.18
Minnesota	(seller)	110	222	2.02
North Carolina	(buyer)	123	257	2.09
California	(buyer)	194	361	1.86
Wisconsin	(seller)	225	333	1.48
Oregon	(seller)	338	499	1.47
Vermont	(seller)	202	376	1.90
Price reporting firm[4]		113	181	1.60
Price reporting firm[4]		113	208	1.84
U.S. average[5]		113	--	--

Notes:

1- Conventional prices for states based on 2001 monthly averages for corn and soybeans reported by USDA. In 2002, the average U.S. price for corn increased 19%; for soybeans, 16%. State prices were adjusted by these amounts before estimating a feed ration price. State prices not available at this time.

2 – Feed ration price based on a 2:1 corn to soybean ratio. Thus, from Illinois, the ration price is calculated as 2/3 * corn price/ton + 1/3 soybean price/ton, or $134 * 2/3 + $300/3 = $189/ton.

3 – Washington dealer quoted a price including full-fat soybeans at $500/ton (oil and meal included). Broiler rations only require the meal, while layers might use the oil in a cooked bean product. This is about 1/3 higher than the standard soybean meal used in a broiler feed. Excluding the value of the oil, the meal price would have been around $350/ton excluding freight.

4 – Prices from private reporting service, 12-month averages for 2002. The first quote discounts food grade soybean prices by 20 percent to estimate a feed grade ration price. The second quote uses the higher food grade soybean price reported by the service. Conventional price is based on U.S. average for 2002/03 reported by USDA in January WASDE report.

5 – U.S. average corn price is $2.35 per bushel, or $84 per ton; average soybean price is $5.10 per bushel, or $170 per ton. Ration estimated as explained in footnote 2.

Appendix 1. Estimated Organic Corn and Soybean Acreage

Surveyed Region	ERS 2001 Corn	ERS 2001 Soybeans	2002* Corn	2002* Soybeans	2003* Corn	2003* Soybeans	2004* Corn	2004* Soybeans
	---number of acres---							
1. **Northeast**[1]	5,346	5,240	2,024	1,260	2,647	1,931	2,694	1,923
2. Other states[5]	--	--						
3. Extrapolated to ERS estimates[6]			5,326	5,727	6,966	8,777	7,089	8,741
4. **South**[2]	3,621	9,757	1,379	2,004	4,506	6,486	5,830	8,390
5. Other states[5]	106	8,310						
6. Extrapolated to ERS estimates[6]			3,629	9,109	11,888	29,982	15,342	38,136
7. **Midwest**[3]	40,515	69,073	22,406	29,227	21,440	27,969	27,989	71,049
8. Other states	40,140	81,362						
9. Extrapolated to ERS estimates[6]			42,275	81,186	40,452	77,691	52,809	197,358
10. **West**[4]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
11. Other states[5]	3,825	725						
12. Extrapolated to ERS estimates			n/a	n/a	n/a	n/a	n/a	n/a
13. Survey states	49,482	84,070	25,809	32,491	28,593	36,386	36,513	81,362
14. Other states[5]	44,071	90,397						
15. Totals	93,553	174,467	51,230	96,022	59,306	115,950	75,240	244,235
Estimated national acreage[7]:	93,553	174,467	96,662	200,046	112,000	241,560	141,962	508,823

Notes: *--Acres for 2002-2004 are based on respondents' projections for these years.

1—Includes CT, DE, MA, ME, NH, NJ, NY, PA, RI, VT; 7 states reported to the survey. No organic acreage was reported by VT, DE, RI in the 2001 ERS study and NH did not respond to the survey, but reported acreage in 2001 for organic corn to ERS.

2—Includes AL, AR, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV. States of OK, TX, MD, NC, and VA responded to the survey.

3—Includes IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI; surveys were sent to growers and buyers in four states: IA, IL, MN, and MO.

4—Includes AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, WY; survey responses not available (n/a) at time of report. Other acreage includes acres reported to ERS in the 2001 study. Alaska and Hawaii not included in surveys.

5--Refers to states that responded to ERS' 2001 survey, but not to university surveys conducted for AMS.

6—To approximate ERS' reported numbers in 2001 *just for those states that responded*, each survey total was divided by its share of actual percentage it represented in the 2001 report. Thus, in the Northeast and South, respondents' acreage represented approximately 38 and 22 percent of actual corn and soybean acreage reported in 2001. In the Midwest, respondents represented approximately 53 and 36 percent of actual acreage reported in 2001. No adjustments were made to Western states, since no respondents were counted.

7—To estimate national acreage, an approximation is needed to represent all states. Using 2001 numbers sent by cooperators, we estimated that if all states had responded, the reported responses would represent 53% of reported corn acreage and 48% of reported soybean acreage. Thus, the totals of extrapolated numbers for all respondents for 2002-2004 were divided by .53 for corn and .48 for soybeans to develop a national acreage estimate assuming the entire population in all states had been surveyed and responded.

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