Biofuels, Food & Feed Tradeoffs

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Rural Development

The Impact of Feed Cost Prices o U.S. Poultry Production: Implications for the Impact of Increased Ethanol Production

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Ethanol Industry Today

- March 13, 2007
  - Current capacity 5.633 BGY, 114 facilities
  - Construction (80)/Expansion (7) 6.395 BGY
  - Total Capacity 12.028 BGY
- September 20, 2007
  - Total Capacity 7.85 BGY
  - 53% increase in six months

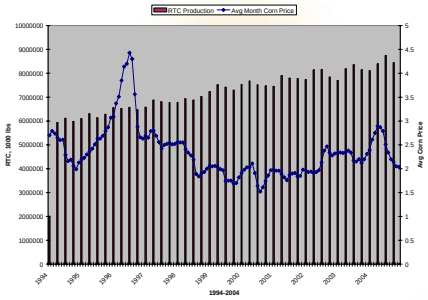
Given the concerns of higher feed costs, the objective of this study is to determine the sensitivity of U.S. broiler production to changes in corn prices.

Specific objectives of this study are:

- (1) to econometrically estimate U.S. broiler supply to asses the impact of feed cost on U.S. broiler production,
- (2) to estimate the elasticity of broiler production with respect to feed cost and corn prices, and
- (3) to project future U.S. broiler production given increases in corn prices resulting from increased demand due an expansion of the ethanol industry.

Corn Prices are typically lower in harvest months

How has the poultry industry responded to high corn prices in the past?



Supply vs. Demand Shocks

- 1995-1996 driven by:
  - declining world stocks
  - U. S. and Foreign weather problems
  - 10% set aside
- 2006-2007
  - Increase ethanol demand
  - Current + Construction production increased 4 BGY from June 23, 2006 to December 29, 2006

Dried Distillers Grains/Solubles

- DDG, DDG/S, WDG
- By product of ethanol production from grain
- A 56 lb bushel of corn yields 18 lbs of DDG/S
- Feed to rudiment animals, beef and dairy
- Some estimate monogastrics, poultry and swine, can consume 10% DDG/S
- This may be optimistic

Problems associated with DDG/S for poultry

Inclusion rates of 5% or greater, passage of undigested feed due to high fiber content.

Can have highly variable nutrient content

- Variability among suppliers
- Amino acid imbalance, nutrient testing

Technology and quality control improving

Problems cont.

Flowability, time and money to unload rail, barge, and trucks.

Currently cost 115% of corn P, needs to be 80%

- If used, fats needed to replace energy from corn.
- Expensive and can have rancidity problems

Estimation Results

U.S. Broiler Supply

$$\Delta Q_t = \underset{(.005)^{***}}{0.0287} + \underset{(.014)^{**}}{0.0311}\,\Delta p_{t-1} - \underset{(.015)^{**}}{0.0358}\,\Delta(f_t/p_t)_{t-1} - \underset{(.079)^{**}}{0.1962}\,\Delta w_{t-1} + \underset{(.105)^{***}}{0.7735}\,\Delta h_{t-1}$$

$R^2 = .52, \quad DW = 2.222$

Chick Demand

$$\Delta h_t = \underset{(.001)^{***}}{0.0328} - \underset{(.016)^{**}}{0.0317}\,\Delta(f/p)_t + \underset{(.091)}{0.0366}\,\Delta w_t$$

$R^2 = .55, \quad DW = 2.058 \quad \rho = 0.740\,(.080)^{***}$

Elasticity Estimates

$\eta_{Q,feed}$ = -0.060 (.012)

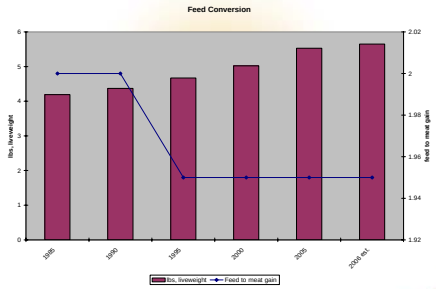
$\eta_{Q,corn}$ = -0.042 (.009)

Corn Price	U.S. Broiler Production 1,000 lbs	Percentage Change
$ 2.50	**11,674,500**	**(Baseline)**
$ 2.70	11,634,968	-0.34%
$ 2.90	11,598,492	-0.31%
$ 3.10	11,564,640	-0.29%
$ 3.30	11,533,066	-0.27%
$ 3.50	11,503,489	-0.26%
$ 3.70	11,475,674	-0.24%
$ 3.90	11,449,428	-0.23%
$ 4.10	11,424,585	-0.22%
$ 4.30	11,401,007	-0.21%
$ 4.50	11,378,572	-0.20%
	Estimated Industry Loss **$ (133,167,474.07)**	Overall Percentage Change **-3%**

Possible reasons for small decrease:

1. Broiler performance
2. Competing meats, Beef and Pork
3. Value added products
4. Vertical Integration

Broiler Performance



Meat Elasticities

	Poultry	Beef	Pork
Poultry	-0.233	0.385	.041
Beef	0.070	-0.850	-0.045
Pork	0.013	-0.107	-1.234

*Eales and Unnevehr, 1993. 3SLS, instrument includes livestock production costs.

Value Added Products

- Tyson reports 70% of it's chicken products are value added. In 2006, 47% of total sales from value added products.
- Demand from restaurants has increased for product consumed away from home
- Time used in meal preparation and planning has decreased.

Long Term Implications

- Are high corn prices here to stay?
  - Increased yields, ability to increase acres
  - Emergence of new ethanol technologies
- If beef and pork are able to adapt to changes, will the elasticities change?
  - If they cannot, high corn prices may benefit the poultry industry.