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### Substitution Effect to the Rescue - Eventually

The world chicken industry currently suffers from much higher costs, in particular grain costs, and chicken prices that have not yet matched the increase in costs. Assuming that grain prices remain high for the indefinite future, the chicken industries in many countries could grow at a rate slower than had been expected. This scenario can be avoided if demand were to somehow increase. Although it is counterintuitive, rising prices of all foods may actually increase the demand for chicken worldwide over the next two years and lead to significantly higher chicken prices.

Demand can increase thanks to the benefits of the substitution effect. The substitution effect may sound like a dusty economic term better left in the classroom but it is actually a quite useful concept. Simply stated, the increase in the price of one product can cause buyers to look for another cheaper product to substitute for the first. If enough people make that substitution, the value of the second product will begin to rise.

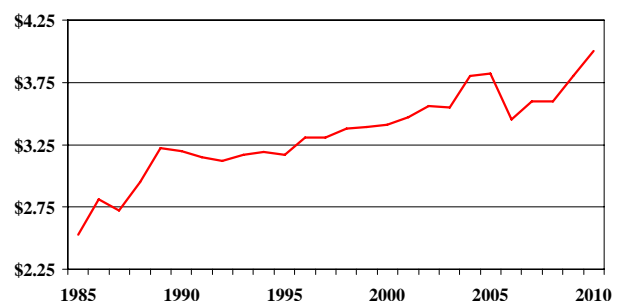
When people substitute a less expensive meat it generally means moving from beef toward pork and chicken or from pork to chicken. In addition, at the lowest income levels, eggs may substitute for chicken. Pork is more expensive to produce than chicken and beef is more expensive to produce than pork because it takes more feed to produce pork and beef than chicken. It takes four pounds of feed to produce one pound of beef and only two pounds of feed to produce one pound of chicken. Cattle raised exclusively on grass would, of course, have an infinitely small feed conversion.

#### Feed Conversion

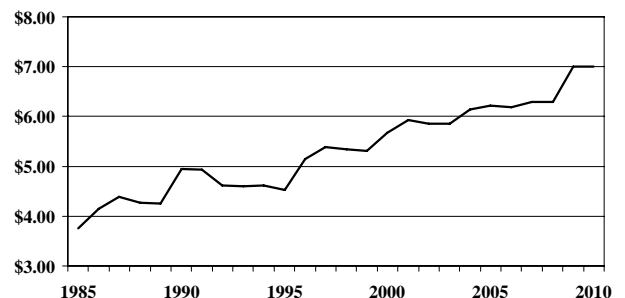
Beef	4-1	(feedlot finishing)
Pork	3-1	
Chicken	2-1	

Over the last few decades, the difference between the price of chicken and other meats has increased thanks to the rapidly increased productivity of the chicken compared to the relatively slower increase in the productivity of hogs and cattle. The following numbers from the US, while most relevant to the US, are typical of the trend lines of beef, pork and chicken prices around the world. Data through 2007 comes from the USDA. Note the jump in the price of pork in 2009 and beef in 2010 that will be explained later.

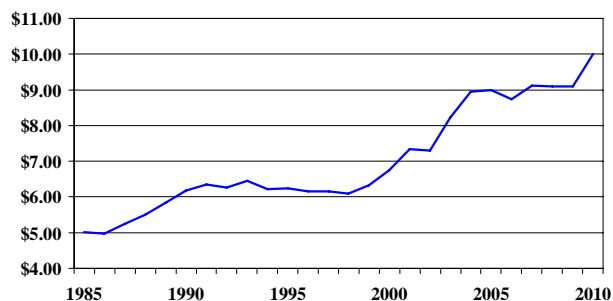
**US Retail Composite Chicken 1985 to 2010**  
Yearly Average – \$/kg



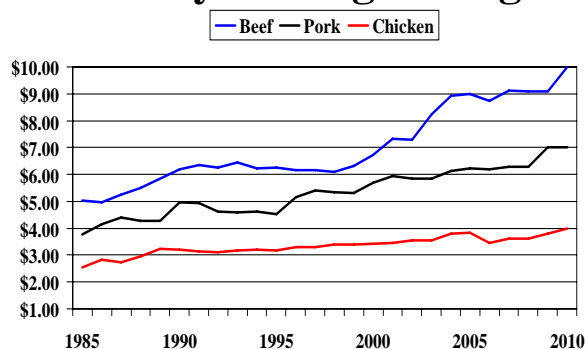
**US Retail Pork 1985 to 2010**  
Yearly Average - \$/kg



## US Retail Beef 1985 to 2010 Yearly Average - \$/kg



## US Retail Beef, Pork and Chicken Yearly Average - \$/kg



In 1985 the composite retail price of chicken adjusted for inflation was a relatively expensive \$4.98 per kilo while pork was \$7.40 and beef, \$9.88. Both chicken and pork became less expensive over the years while beef remained about the same. Chicken became comparatively less expensive than beef over time. In 2010 beef is likely to be \$6 per kilo more expensive than chicken compared to an inflation adjusted difference of only \$5 in 1985.

### Inflation Adjusted Price

	Chicken	Pork	Beef
1985	4.98	7.40	9.88
2010	4.00	7.00	10.00

During a period of high grain prices and a slowing world economy like the world is witnessing in 2008 and 2009, the difference in production costs between chicken and other meats can lead to substitution for two reasons;

- 1) In times of economic stress some consumers shift from higher priced meats to lower priced meats, this effect occurs relatively rapidly
- 2) The difference in cost between beef and chicken widens during a period of high grain prices because of the feed conversion difference. The consequence, much higher beef prices, is subject to a significant time lag.

### Time Lag

The substitution effect cannot be fully realized until retail beef and pork prices rise. Unfortunately for chicken producers there is a significant time lag in meat prices. From the moment grain prices increase it can take years for the effect to be fully realized in retail prices. The time lag is caused by livestock biology and the organization of the meat industry. In the case of beef in the US for example, the industry is divided into three parts; cow-calf operations that produce the feeder cattle; feedlots that fatten the cattle; and slaughter houses. The following is an approximate time lag between higher grain prices and higher consumer prices.

### After a Significant Increase in Grain Prices

**The First Six Months:** In order to remain profitable, feedlots reduce the price paid to cow-calf operators for feeder cattle. No change in consumer beef prices.

**Second Six Months:** After sustaining a period of losses, cow-calf operators begin to reduce the number of cows. No change in consumer beef prices.

**Start of the Second Year:** Larger numbers of cattle than normal begin to show up at the feedlots due to the partial liquidation of cows. Consumer beef prices drop.

**End of the Second Year:** Smaller numbers of cattle are available to feedlots. Feedlots start to pay more for cattle. Consumer beef prices remain the same.

**Start of the Third Year:** Feedlots lose money for a while until lower numbers of cattle finally have an effect on the price paid for cattle by slaughter houses. Consumer beef prices begin to rise.

**End of the Third Year:** Lack of cattle forces slaughter houses to pay more for cattle and consumers to pay more for beef. Consumer beef prices rise substantially.

The significant grain price event started at the end of 2006. The three year time lag for beef will run its course at the end of 2009. The “jump” in beef prices is therefore still a year away. The pork industry will adjust one year earlier at the end of 2008. When the competing meats eventually increase in price at the retail level, the chicken industry can expect a surge in demand and significantly higher prices thanks to the substitution effect.