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# Product Differentiation: Implications for Agricultural Producers

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# Product Differentiation: Implications for Agricultural Producers

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## Introduction

1. Agricultural and food products have become increasingly differentiated.

   - More and more private label food products have been offered in retail food stores as alternatives, usually lower cost ones, to national brands (Volpe 2011). The sales of private label grew at 4.5% annually while the sales of national brands declined during the 2003-2008 period (the Food Institute 2009). .
   - Food manufacturers and retailers have been adding more brands of meats, vegetables, fruits, and dairy products. For instance, the share of branded beef products in all beef products has increased from 42% in 2004 to 63% in 2010 (National Cattlemen's Beef Association 2010).
   - For each brand, more varieties have been provided to consumers. These varieties are often differentiated by product and package attributes, such as eating quality, fat content, sugar content, labeling, etc.

2. The Implications

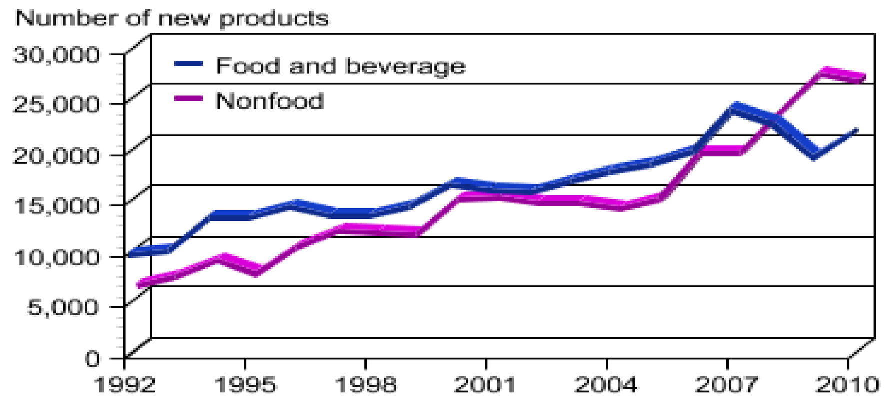
   - Implications of product differentiation (especially the differentiation conducted by food marketers) for agricultural producers have not been thoroughly analyzed.
   - Understanding these implications becomes even more imperative when the rising concentration in U.S. agricultural and food industries has led to concerns about the anticompetitive effects of market power on farm prices and producer welfare (U.S. Department of Justice, U.S Department of Agriculture 2012).

## Objectives

- Develop a simple conceptual framework to analyze how two forms of product differentiation influence prices received by agricultural producers.
- Analyze how the forms of product differentiation and market power jointly affect farm price and producer welfare.

**New product introductions of consumer packaged goods, 1992-2010**

After declining between 2007 and 2009, the number of new food and beverage products rebounded in 2010




Source: USDA, ERS calculations using data from Datamonitor.

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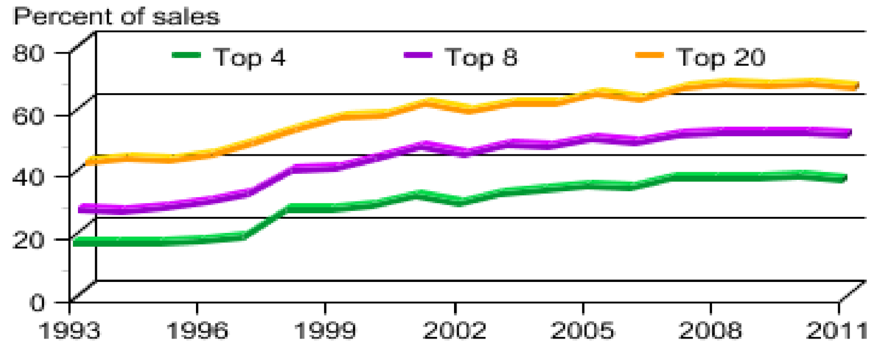
**Top 4, 8, and 20 firms' share of U.S. grocery store sales, 1993-2011**

The 2007-09 recession has dampened rising shares of sales in recent years




Note: Sales based on North American Industry Classification System (NAICS).

Source: USDA, ERS calculations using data from U.S. Census Bureau, Monthly Retail Trade Survey, 1992-2012; and company annual reports.

## The Model

- Several ($N$) oligopoly food marketers, who purchase a raw agricultural material from a large number of farmers, process the raw material to obtain multiple differentiated food products, and sell those differentiated products to consumers.
- The raw agricultural material is modeled as a homogeneous good and product differentiation is conducted by food marketers.
- We solve for the market equilibria for the farm market and the retail market for each of the following scenarios:
  (1) the benchmark case when there is no product differentiation, i.e. the processed products are homogenous;
  (2) the vertical differentiation case when food marketers provide $m$ ($m \geq 2$) vertical differentiated products.
  An example is the case of private label and national brands of a food product.
  (3) the horizontal differentiation case when food marketers provide $k$ ($k \geq 2$) horizontal differentiated products.
  Fluid milk products with different fat content, i.e. skim, 1%, 2%, and whole milk, are a good example.
- We compare the market equilibria of the benchmark case and the product differentiation cases to find how different product differentiations affect the price received by farmers and farmer welfare.
- In addition, we study whether and how product differentiation influences the anticompetitive effect of food marketers' market power on the farm price.

## Results

- Vertical differentiation conducted by food marketers can lead to a higher farm price and a larger quantity of agricultural material sold so that farmer welfare will be improved.
- Horizontal differentiation conducted by food marketers usually have little effects on farm prices and quantities.
- The anticompetitive price effect of market power along the supply chain can be alleviated when there is vertical product differentiation.
- The harmful effect of food marketers' market power usually cannot be changed by horizontal differentiation.

## Conclusions

- Different forms of product differentiation cause food marketers to adopt different selling strategies in the retail markets, thus, in turn, lead to different impacts on farm prices and producer welfare.
- Vertical differentiation such as the case of private label and national brands allows food marketers to charge lower prices, compared to the price level when there is no product differentiation, for low-quality varieties so that the total quantity of products sold to consumers will be larger. A larger retail quantity leads to a higher farm price and more producer welfare.
- Horizontal differentiation such as the case of various fluid milk products with different fat content can provide more choices of product attributes to consumers but the price levels are usually comparable to the price before the product differentiation took place. Thus, total retail quantity is largely unchanged and there is little effect on farm price and quantity, and the anticompetitive effect of food marketers' market power.