Food Choice and Food Technology

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Changing the Options

- Technology promises to widen the food product options available
- These technologies will be effective in improving consumer wellbeing if
  - Consumers purchase them
    - Price, Taste, Perception (is it different)?
  - Producers sell the item
    - Costs? Price premia?
  - If the improvements are not imiserizing
    - Do consumers understand the improvement
    - Are there unintended consequences?
- Much of this depends on whether consumers know they are consuming new products
Food Choice and the Rational Man

- Many suppose that individuals use information efficiently
  - The consumer will use available information
  - Can weigh the various consequences of their actions
  - Gives appropriate weight to vague or narrow information

- Individuals make more than 300 food related decision each day (Wansink and Sobal)
  - Paying close attention to each would be a waste of time
  - We naturally fall back on heuristics, habits and rules of thumb
The Implications of Heuristic Choice

- Heuristics are at best approximations
  - They are subject to serious error under the wrong conditions
  - E.g., clean plate rule can be reasonable under some circumstances and not in others
  - May represent misperceptions

- The implication
  - The consumer makes systematic errors
  - The consumer could be better off
    - Cognitive costs are prohibitive
Lessons From Previous Attempts: Price

- Sometimes we are price sensitive and sometimes we are not
  - Increasing the prices of all sweet cereals will induce fewer changes than increasing the prices on a very select few sweet cereals (Binkley and Golub)

- If price differences are substantial and a close substitute to less healthy options
  - Only health conscious and those who understand the good will buy
  - Even if costs are low, there could be price discrimination opportunities
  - Willingness to pay will depend on how different the products are perceived to be
Lessons From Previous Attempts: Taste

- Taste is highly suggestible and will depend heavily on marketing
  - Appearance of the word “soy” poisons taste (Wasnink)
  - People claim the ability to taste differences that they cannot, in fact, detect (Just et al.)
  - Anticipated taste has a big influence on taste (Tuorilla et al.)
  - Some restaurant chains have introduced reduced-fat mayonnaise, or other changes quietly to avoid this problem
Lessons From Previous Attempts: Imisserizing Compensation

► Narrow health claims distract from more broad health measures (van Ittersum et al.)
  ◆ Low fat, low calorie, low sugar, etc.

► When focusing on narrow claims, individuals may eat more than they intend
  ◆ “I can indulge in more because this is healthier”
  ◆ “I will eat dessert because the main course was healthier”

◆ Compensation can quickly overwhelm health benefits
The Role of Marketing

- Consumption decisions (food and amount) are the result of a game between manufacturers and consumers.
  - Consumers are not entirely aware of their behavior:
    - Misunderstand information
    - Misperceive the consequences of consumption
  - Marketers may behave ‘as if’ they are aware
- In the case of introducing better foods:
  - Marketers can choose to differentiate or not
  - Consumers then respond to the new product landscape
Suppose a new good \( x \) is introduced that is similar to good \( y \) already in the market:

- Has much better health qualities than \( y \)
- Consumer cannot perceive a difference between \( x \) and \( y \) unless they are told

Consumer solves:

\[
\max_{x,y} U(x, y) \quad \text{s.t.} \quad w \geq p_x x + p_y y
\]

And receives true benefit:

\[
V(x^*, y^*)
\]

\( V(x, y) : V_x(x, y) > V_y(x, y) \quad \forall x, y \)
Differentiation

► Suppose that the marketers differentiate the products
  ❆ Draw attention to the health differences
    ► Likely to distort the perceived health effect
    \[ U_x (x, y) > V_x (x, y) \forall x, y \]
    ► Willing to pay more for the new product
    ► Some may be more health conscious than others
Consumer Choice and Welfare

\[ w = p_x x + p_y y \]
Consumer Choice and Welfare

\[ V(x, y) = k \]
Consumer Choice and Welfare
Consumer Choice and Welfare: Strong Preference for Health

\[ U(x, y) = k \]
Consumer Choice and Welfare: Healthy, but Bad Taste or Frankenfood

\[ U(x, y) = k \]
Consumer Choice and Welfare: Healthy, but Bad Taste or Frankenfood

\[ U(x, y) = k \]
Consumer Choice with Differentiation

- Differentiation leads to perceived differences
- Health conscious will likely be willing to pay more than the innovation is worth
  - Also may cause offsetting behaviors
  - Could cause a loss in actual welfare if the price is higher than the innovation really justifies
- Expectation of poor taste or other stigma will reduce willingness to pay
  - Will cause a loss in welfare as the consumer forgoes health benefits
- Heterogeneous consumers will bifurcate demand
No Differentiation

Suppose the producer decided not to differentiate

- The consumer is thus unaware of any special benefit of the new product
- Thus, identical perceived benefit for consuming identical amounts,

\[ U(x, y) = k, \text{ for all } x + y = c \]
Consumer Choice and Welfare

\[ V(x, y) = k_1 \]

\[ w = p_x x + p_y y \]

\[ U(x, y) = k_2 \]
Consumer Choice and Welfare

\[ V(x, y) = k_1 \]

\[ U(x, y) = k_2 \]

\[ w = p_x x + p_y y \]
Consumer Choice without Differentiation

► Whichever product has a lower price will be the only one sold
  - Severe loss of welfare if $x$ disappears from the market
  - No loss of welfare if $y$ disappears from the market
► Must also recognize under-substitution from imperfect substitutes
The Producer Decision

► If differentiate, the market will segment
  ✶ Price discrimination
  ✶ Price for each good: cost + adjustment
    ► Adjustment dependent on relative elasticities of demand and size of markets
    ► Positive for good with most inelastic demand
    ► Negative for the other good

► Likely to lead to higher priced healthy goods that appeal primarily to health conscious
  ✶ Health conscious pay too much, may consume too much
  ✶ Mainstream benefit from lower prices, but may be worse off if purchase more of the less healthy item
The Producer Decision

 ► If don’t differentiate, consumers are not aware of innovation
   ▶ Must charge the same or lower price or else the good will not be purchased
   ▶ All consumers then benefit from added health properties (though they don’t know it)
   ▶ No compensating behavior

 ► But, no differentiation will almost always lead to lower profit
   ▶ Exceptions if average costs are lower if only one good offered
Conclusion

► Differentiation of products leads to anomalous consumer behavior
  - Goods are simplified into good/bad
  - Health measures often backfire
    - Both for those who desire better health and for those who don’t

► Not differentiating will not lead to optimal consumption
  - But probably much closer for most
  - Many more benefit

► Firms are motivated to make health innovations if they can capture some of the benefit
  - Under most circumstances this will require differentiation
Conclusion

► From a policy perspective
  ▶ No health halos means fewer healthy goods come to market, but more consumers will benefit
    ▶ May mean an overall welfare increase
    ▶ Are there ways to overcome the barrier?
    ▶ How to accomplish?
  ▶ Are there ways to overcome the narrow benefits of differentiated products?
    ▶ Innovations in production technology that reduces cost for healthier products
    ▶ Greater competition will force prices to marginal costs
► Structural problems in behavior can limit the impact of improved products