IFIS International Food Ionizing Processing Symposium

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Glowing Acceptance

Consumers, Importers and Retailers Responses

to Irradiated and Imported Apples

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Consumers, Importers and Retailers Response to Irradiated and Imported Apples.

Introduction

The United States is phasing out chemical fumigation and adopting more environmentally friendly and healthier alternatives like irradiation. However, adopting this novel technology could disrupt this major export, if buyers and sellers reject it. We estimate Mexican consumers' willingness to pay for imported apples treated with irradiation compared to more commonly used chemical postharvest treatments. We find key drivers of consumers' choice, include social, demographic, access to information, and country of origin labels. Consumers require a discount to purchase apples treated with irradiation. However, their responses become much more positive when exposed to information that explains what irradiation is and its benefits. Importers and retailers indicated no aversion to the technology. Their primary concern is the technology's potential cost and benefit to the fruit's price and quality.

Motivation

- Government policies to address climate change can have unforeseen and undesirable economic implications.
- What are the possible consequences of U.S. federal government's mandate for apple producers to use irradiation instead of chemicals like methyl bromide for post-harvest treatment?
- We want to study Mexico, as it is the largest export market for U.S. apples.

Research Objective

- Obtain usable measures of the acceptance of the entire Mexican importation supply chain to U.S. apples that had been treated with irradiation as postharvest treatment.
  - Consumers willingness to pay (WTP) for the produce conditional on information set and various socio-demographic characteristics including gender, education, and income.
  - Retailers/importers willingness to work with the produce and ascertain their knowledge of the technology and their perception of their customers reaction to the technology.
- We want to explore policy implications including, for mitigating undesirable outcomes by exploiting information and socio-demographic factors.

Data
& Methodology.

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Consumer Acceptance

- **Quantitative assessment** to measure **WTP for imported apples, treated with irradiation** versus local untreated or chemically treated alternatives.
- Online survey of **2107 respondents** in Mexico.
- Questions included hypothetical scenarios with 3 choice options and **3 information treatment** groups.
- Empirical technique incorporated a metric of respondent's **certainty of responses** to reduce hypothetical bias.

Importer/Retailer Acceptance

- **Qualitative assessment** to ascertain willingness to work with irradiated
- Online survey of 15 retailers and 26 importers in Mexico.
- Received **responses from** only **7 importers** and **2 retailers**.
- Compare importer/retailer perception of consumer drivers with consumer responses.

Scenario 1.

Features	Option A	Option B	Option C
Probability of finding an insect inside the apple	0% 	10% 	
Post-harvest treatment	No	Irradiation	
Country of origin	Mexico 	Mexico 	
Price (Mex$/kg)	38.9	54.9	
I would choose			

If you indicated that you would be willing to buy Product A or B, how certain are you of your answer in a scale of 1 to 10, where 1 = Very Uncertain and 10 = Very Certain.

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

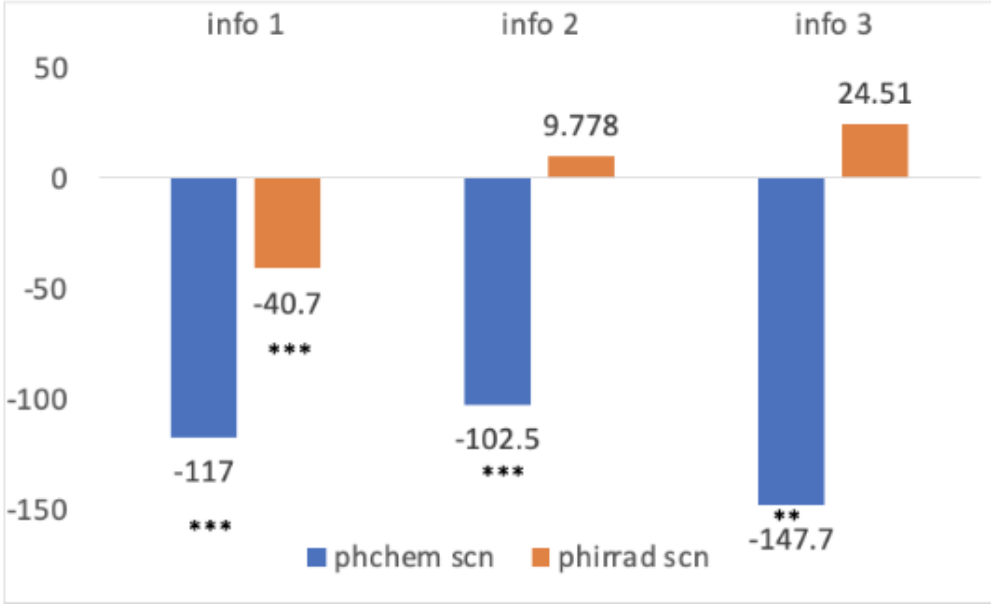
Consumer Acceptance.

- Explore policy implications for information and socio-demographic factors.
- Information treatments:
  - 1, the control: no information on irradiation technology is provided.
  - 2: information on irradiation from scientific sources including WHO, the FAO of the United Nations, and the IAEA.
  - 3: information on irradiation from a mom blogger.

Attributes	Level A	Level B	Level C
Probability of finding an insect inside the apple	0	10	-
Postharvest treatment	Irradiation	Other postharvest chemical	No postharvest treatment
Country of origin	United States	Mexico	-
Price (Mexican peso $/kg)	$38.0/kilo	$46.9/kilo	$54.9/kilo

Consumer Acceptance

Findings



- On average, respondents require **discounts of between 19.38 pesos/kg - 51.09 pesos/kg (or 35% - 93%*)** to purchase apples treated with irradiation.
- On average, respondents are willing to accept discounts of between 77.47 pesos/kg - 139.30 pesos/kg to purchase apples treated with chemicals.
- **Information** from either scientific or layperson blog sources **increases WTP** (reduces the discount) for irradiated apples.
- **WTP** for irradiated apples is affected by **age, gender, income, family size, and level of education**.

Importer/Retailer Acceptance.

- We gauge attitudes toward imported apples treated with irradiation.
- Examine the drivers of their purchase decisions and their perspectives on their customers' motivations.
- Examine the trusted sources of information and whether retailers and importers would be willing to use the information to help the purchase decisions of their customers
- Primary states of their operations are Aguascalientes, Baja California, Coahuila, Guanajuato, Nuevo León, Querétaro, San Luis Potosí, Tamaulipas.
- Importers employed approximately 200 employees and had sales of more than 5 million pesos per annum. Retailers employed approximately 11,000 employees and had sales of more than 50 million pesos per annum.

Importer/Retailer Acceptance

Findings

- **Consumer preference is the most critical driver**, indicated by all respondents.
- The ability to improve market share and increase market performance was next in importance.
- All **respondents** indicated general **indifference to the technology** employed.
- The choice of supplier was primarily motivated by consistency in the volume and quality supplied, and respondents needed to be more motivated by country of origin and volume arrangement.

Importer/Retailer Acceptance

Findings

- **No aversion to** importing fresh fruits treated with **irradiation** from the U.S.
- **No interest in** the **pre- or post-harvest treatment methods** by either importers, retailers, or consumers.
- They believe that the primary consideration by both consumers and sellers of fresh apples is the price and appearance of the fruit.
- **Any campaign** to mitigate any adverse reaction to the technology **should focus** on the potential benefits of the technology to **reduce shrinkage to the sellers** and the **health benefits to the consumers.**

What other factor would lead you to sell irradiated fruits?

“Shrinkage reduction and increased shelf life!”

Quote By Anonymous Retailer

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