

CONSUMER RETAIL PRICE SENSITIVITY

DRS. TONSOR & LUSK



**Spring 2021 Retail Advisory Committee/
Packer Processor Industry Council Meeting**

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MOTIVATION

- Most pork demand research uses very aggregated data
- KSU (USDA-based) pork demand indices: -0.31 own-price elasticity
 - Masks over product differences (loin=ribs=bacon)
 - Masks over regional/market differences (CA=TX=NY)
- ✓ Refined demand insights lead to improved market understanding and more accurate conclusions on policy impacts, impacts of production cost changes, etc.

OBJECTIVE

- To document how sensitive consumer pork purchasing behavior is to prices across retail markets and pork products.

TIMELINE

- Project Initiated Dec. 2020
- Data Acquisition (covers Jan. 2016 – Dec. 2020)
 - Weekly IRI sales & volume data
- Completed March 2021

PROCESS OVERVIEW

1. Estimate own-price elasticities

- by Market (n=51)
- by Product (n=6: Loin, Ribs, Shoulder, B & D Sausage, Bacon)

Table 1. Retail Markets Examined

Albany, NY	New England
Atlanta, GA	New Orleans, LA/Mobile, AL
Baltimore, MD/Washington D.C.	New York, NY
Birmingham/Montgomery, AL	Orlando, FL
Boise, ID	Peoria/Springfield, IL
Boston, MA	Philadelphia, PA
Buffalo/Rochester, NY	Phoenix/Tucson, AZ
Charlotte, NC	Pittsburgh, PA
Chicago, IL	Portland, OR
Cincinnati/Dayton, OH	Providence, RI
Columbus, OH	Raleigh/Greensboro, NC
Dallas/Ft. Worth, TX	Richmond/Norfolk, VA
Denver, CO	Roanoke, VA
Detroit, MI	Sacramento, CA
Grand Rapids, MI	San Diego, CA
Harrisburg/Scranton, PA	San Francisco/Oakland, CA
Hartford, CT/Springfield, MA	Seattle/Tacoma, WA
Houston, TX	South Carolina
Indianapolis, IN	Spokane, WA
Jacksonville, FL	St. Louis, MO
Knoxville, TN	Syracuse, NY
Las Vegas, NV	Tampa/St. Petersburg, FL
Los Angeles, CA	Toledo, OH
Louisville, KY	West Texas/New Mexico
Miami/Ft. Lauderdale, FL	Wichita, KS
Nashville, TN	

PROCESS OVEVIEW

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 - by Market (n=51) &
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2. Summarize differences in price-sensitivity
 - Results tabulated for reference in future projects
 - Maps generated for informative presentation of key points

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3. Application Examples
 - consumer welfare impacts of 1% increase in retail pork prices
 - retail price impact of 1% reduction in pork availability
 - impact of expected demographic shifts

RESULTS EXAMPLES

Consider Los Angeles, CA market (Jan 2016 – Dec 2020):

- 22% of pork volume in form of Loin (lowest of 51 markets)
- 18% of pork expenditure in form of Ribs (highest of 51 markets)

RESULTS EXAMPLES

Consider Los Angeles vs New York market (Jan 2016 – Dec 2020):

	Los Angeles			New York	
	Retail \$/lb	Retail, Annual Per Capita Volume (lbs)		Retail \$/lb	Retail, Annual Per Capita Volume (lbs)
Loin	\$ 2.96	1.76		\$ 2.83	2.71
Ribs	\$ 2.61	1.82		\$ 3.01	1.22
Shoulder	\$ 1.70	1.05		\$ 1.53	0.76
Breakfast Sausage	\$ 3.33	0.59		\$ 4.22	0.15
Dinner Sausage	\$ 3.35	0.72		\$ 3.40	1.31
Bacon	\$ 5.34	1.50		\$ 5.70	1.34
Pork (Aggregate)	\$ 3.13	8.81		\$ 3.30	7.83

RESULTS EXAMPLES

LA's own-price elasticity estimates:

- Loin: -1.189
 - So a 1% change in loin price in LA =
1.19% decline in purchased loin volume

RESULTS EXAMPLES

LA's own-price elasticity estimates:

- Loin: -1.189
- Ribs: -3.170
- Shoulder: -1.674
- B. sausage: -2.729
- D. sausage: -1.501
- Bacon: -0.832

RESULTS EXAMPLES

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RESULTS EXAMPLES

LA's own-price elasticity estimates:

- Loin: -1.189
- Qty changes more than Price
- Consumer expenditures (& pork seller revenue) decrease when prices increase
 - Across the 51 evaluated markets
 - Median = -1.145
 - 16 are inelastic (-0.233 for Wichita) & 35 are elastic (-2.704 for Pittsburgh)

RESULTS EXAMPLES

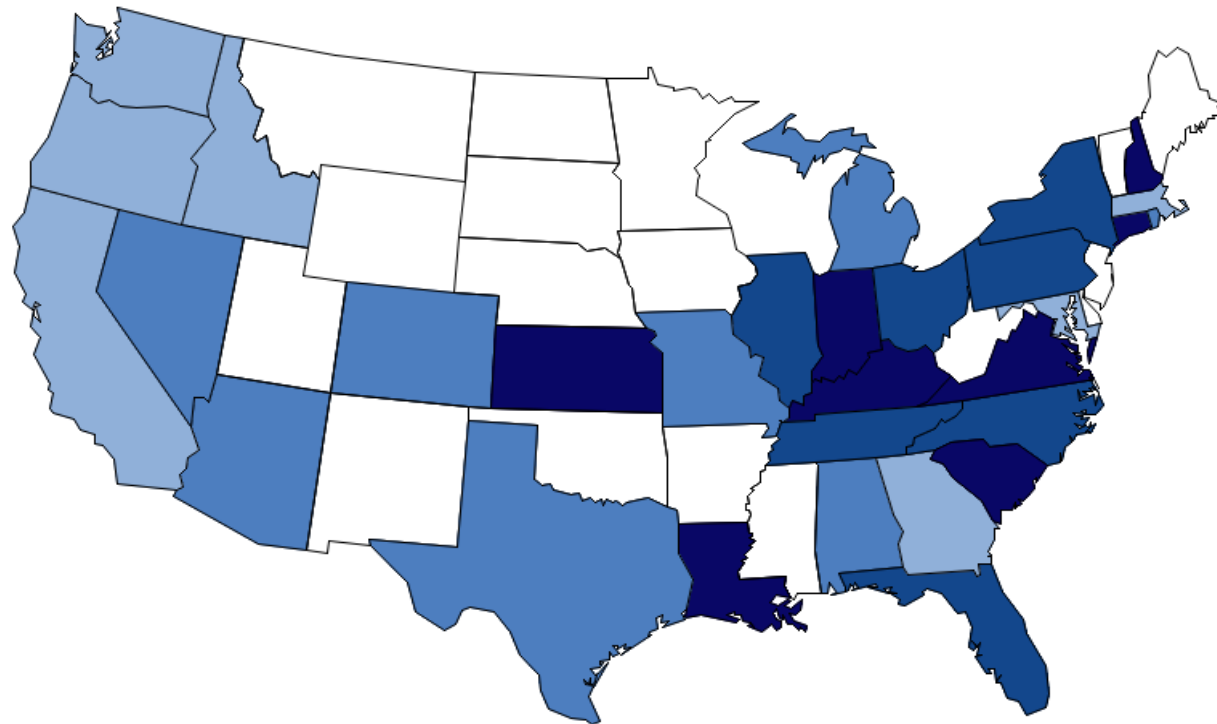
LA's own-price elasticity estimates:

- Loin: -1.189
 - So flexibility is -0.841
 - A 10% reduction in loin available in LA market = 8.41% increase in price

RESULTS EXAMPLES

Approximated state-level patterns: LOIN

Approximated State-Level Average Annual Per Capita Purchased (lbs), Loin



Loin
■ 1.880 - 2.999 ■ 3.086 - 3.513 ■ 3.527 - 3.914 ■ 4.298 - 4.665

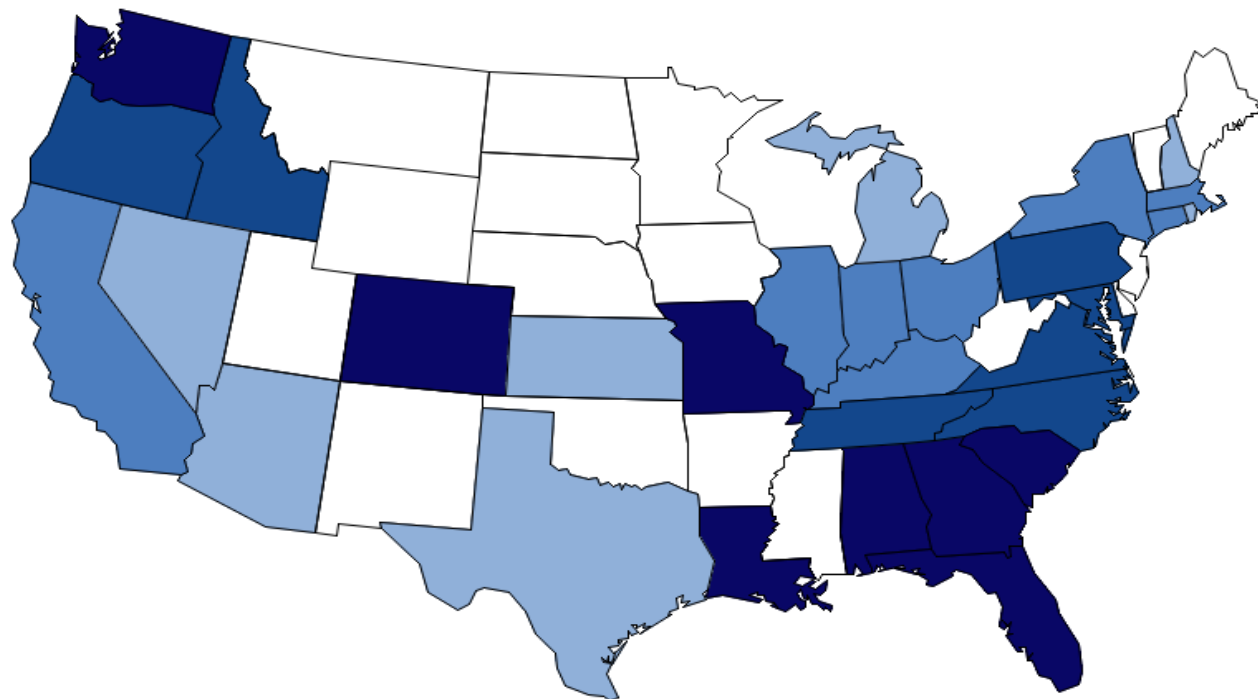
Source: Tonsor & Lusk, 2021

- 25% of states consume less than 3.0 lbs of loin annually: CA & WA
- 25% of states consume over 4.0 lbs of loin annually: IN & KY

RESULTS EXAMPLES

Approximated state-level patterns: LOIN

Approximated State-Level Average Price (\$/lb), Loin



Loin

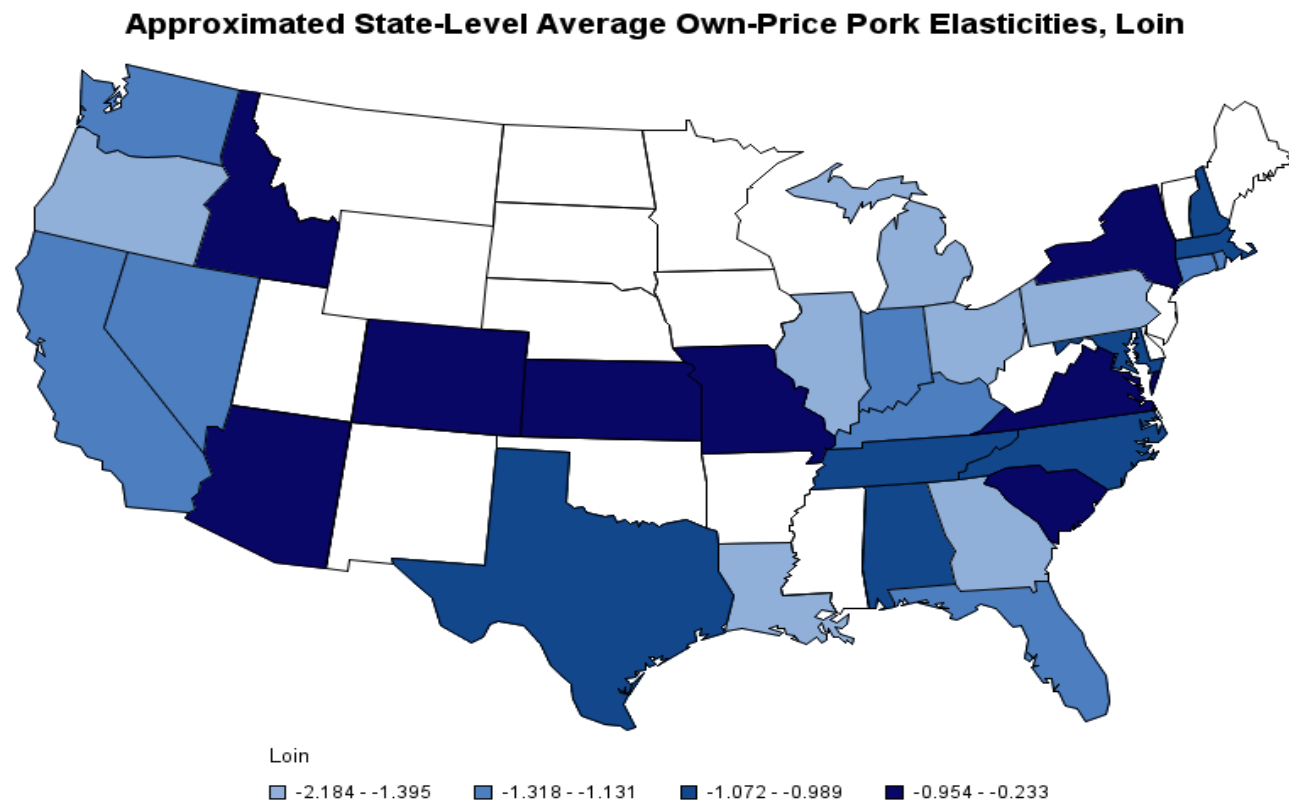
■ \$2.75 - \$2.94 ■ \$2.94 - \$3.09 ■ \$3.11 - \$3.26 ■ \$3.30 - \$3.65

Source: Tonsor & Lusk, 2021

- 25% of states have average loin prices below \$2.94/lb: AZ & TX
- 25% of states have average loin prices over \$3.30/lb: FL & GA

RESULTS EXAMPLES

Approximated state-level own-price elasticity patterns: LOIN



Source: Tonsor & Lusk, 2021

So a 1% increase in loin price

=

- 25% of the states reduce loin purchases by 1.40% or more: IL & OH
- 25% of the states reduce loin purchases by 0.95% or less: AZ & MO

RESULTS EXAMPLES

How are consumers impacted by a 1% increase in retail prices (that does NOT come from demand enhancements)?

- Consumer Surplus (\$1,000)

	Los Angeles		New York
	Consumer Surplus		Consumer Surplus
Loin	\$ (930.84)		\$ (1,507.80)
Ribs	\$ (837.82)		\$ (715.16)
Shoulder	\$ (319.02)		\$ (225.84)
Breakfast Sausage	\$ (347.51)		\$ (123.60)
Dinner Sausage	\$ (431.16)		\$ (870.28)
Bacon	\$ (1,422.93)		\$ (1,494.88)
Pork (Aggregate)	\$ (4,492.66)		\$ (5,066.50)

TAKE-HOME SHORT LIST

- Refined Elasticity Insights = Improved Market Understanding
 - Data = Knowledge = Power
 - Periodic Reassessment (“post-covid” vs “pre-covid” ?) Encouraged

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 - Price increases have VERY different impacts on consumers & pork sellers
 - Price increases result in higher pork seller revenues in SOME cases (inelastic cases)

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- Changes in Beef & Chicken \$ Have Comparably Lower Impact
 - Cross-Price impacts moderating over time?

See full report for much more information:

<https://www.agmanager.info/livestock-meat/meat-demand/meat-demand-research-studies/consumer-sensitivity-pork-prices-comparison>

