
# THE IMPACT OF RAISING BROILER WITHOUTH ANTIBIOTICS ON US CHICKEN CONSUMER

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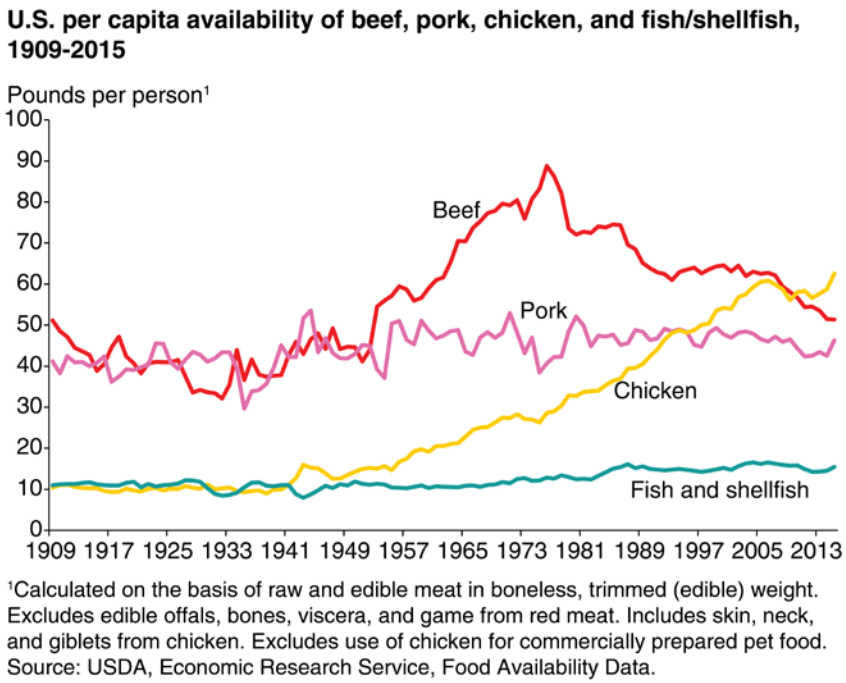
# Chicken Consumption




- Americans consume more chicken than any other protein
- Chicken availability per person has more than doubled
- US is the largest producer and 2nd largest exporter of poultry

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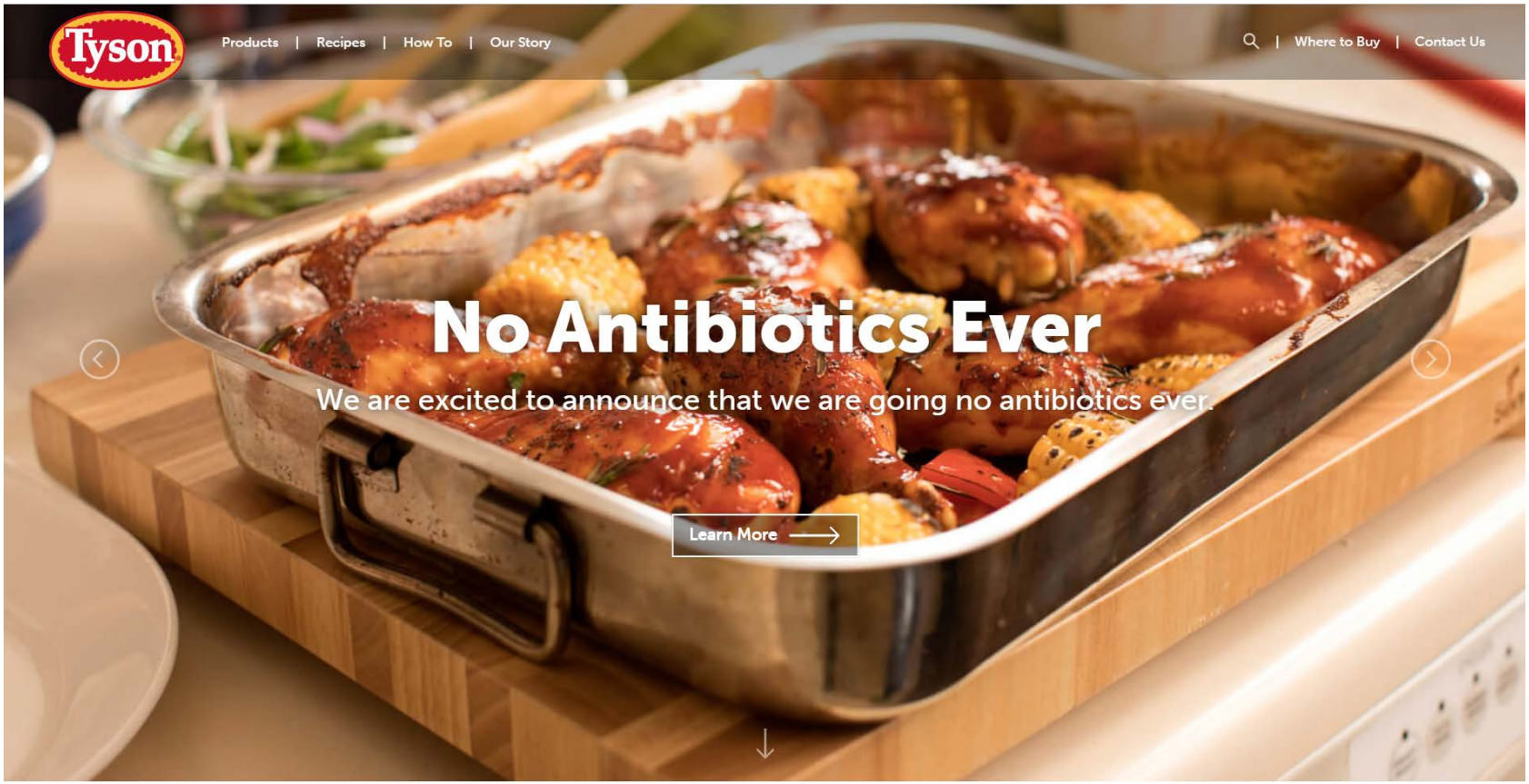
# Tyson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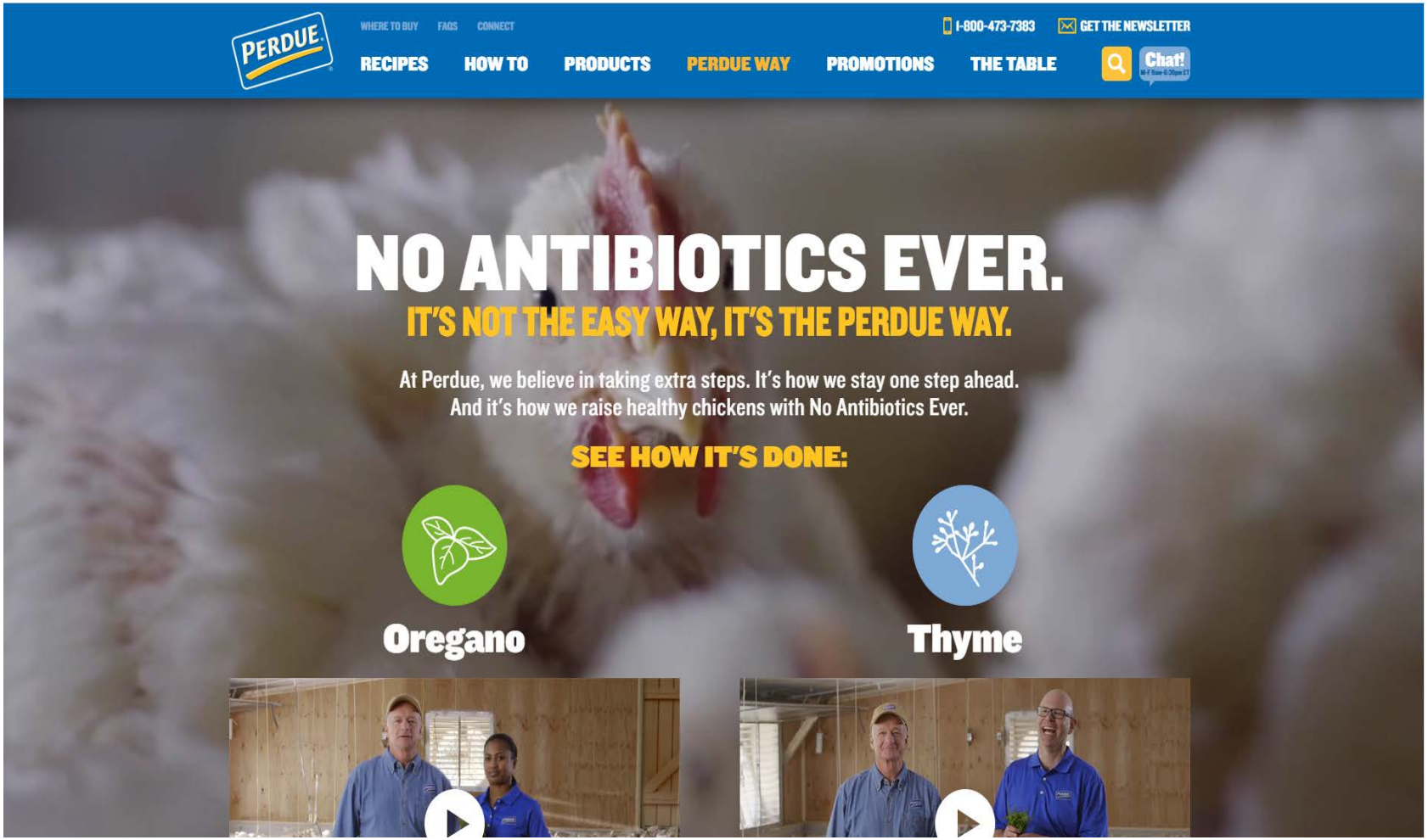
# Perdue

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# Introduction


# Introduction

- Consumers are demanding and are willing to pay for food which promote animal welfare (Clark et. al, 2017)
- While a percentage of the population considers animal welfare an important factor in purchasing decisions, a much smaller share of consumers actually purchase products that reflect this attribute (Grethe, 2017)

# Objective

Explore the “welfare paradox” (Sullivan, 2013) impact on consumer demand using Nielsen Retail Scanner Data

Welfare Paradox posed by consumers who express a strong preference for improved animal welfare in theory, but do not demand heightened animal welfare in practice

# Literature Review

- Prior work assesses a consumer's willingness to pay for animal welfare attributes in meat products through the use of choice experiments and conjoint analysis, among other methods(Lagerkvist et al, 2006; Lusk, 2006; Clark et. al, 2017)
- Syndicated data has been used to examine the complementary and substitutability of meats including beef, pork, poultry and fish by cuts (Thompson, 2004; Kinnucan et al., 1997; Eales and Unnevehr,1993)

# Data

- Nielsen Retail Scanner Data from Kilts Marketing Center from 2009 to 2015
- Weekly data aggregated to monthly level
- Brands divided into two groups: raised without antibiotics (RWA) and conventional (CNV)

# Method

## Almost Ideal Demand System (AIDS)

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \ln(x / P)$$

Where
$w_i$ is the budget share of good i, $P_iQ_i/Y$
$P_j$ is the price of the commodity
And P is a price index defined by $\ln P = a_0 + \sum_k \alpha_k \ln p_k + \frac{1}{2}\sum_j \sum_k \gamma_{kj} \ln p_k \ln p_j$

To be consistent with economic demand system the adding up restriction, homogeneity and symmetry properties are imposed

Adding Up: $\sum_{i=1}^{n} \alpha_i = 1 \quad \sum_{i=1}^{n} \gamma_{ij} = 0 \quad \sum_{i=1}^{n} \beta_i = 0$

Homogeneity: $\sum_j \gamma_{ij} = 0$

Symmetry: $\gamma_{ij} = \gamma_{ji}$

# Method

## Estimating Elasticities

| | | |
|---|---|---|
| Expenditure Elasticity | $1+\frac{\beta_i}{w_i}$ | Determine if a good is a luxury, necessity, or inferior good |
| Cournot Elasticity (uncompensated) | $\frac{\gamma_{ij}-b_i w_i}{w_i}+\delta_{ij}$ | Percentage of response in quantity demanded resulting from a 1% change in price, holding **nominal expenditures** constant |
| Slutsky Elasticity (compensated) | $\frac{\gamma_{ij}}{w_i}+w_j-\delta_{ij}$ | Percentage response in quantities demanded resulting from a 1% change in price, holding **real expenditures** constant |

# Results

| | | Slutsky Price Coefficent | | | |
|---|---|---|---|---|---|
| | Expenditure Coefficient | Conventional | | RWA | |
| CNV | | Breast | Leg | Breast | Leg |
| Breast | 0.002 | -0.532*** | 0.484*** | 0.049 | -0.001 |
| Leg | -0.112 | | 0.058*** | -0.106* | 0.007** |
| RWA | | | | | |
| Breast | 0.106 | | | -0.106*** | 0.000 |
| Leg | 0.004 | | | | 0.207*** |

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# Elasticities

| | | Slutsky Elasticity | | | | Cournot Elasticity | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Expenditure Elasticity | CNV | | RWA | | CNV | | RWA | |
| CNV | | Breast | Leg | Breast | Leg | Breast | Leg | Breast | Leg |
| Breast | 1.00* | -1.51*** | 1.23*** | 0.27*** | 0.00 | -2.03*** | 0.93** | 0.09 | 0.00 |
| Leg | 0.62 | 2.15*** | -2.55*** | .373*** | 0.03*** | 1.82*** | -2.73*** | 0.26 | 0.03** |
| RWA | | | | | | | | | |
| Breast | 1.59*** | 0.79*** | 0.62*** | -1.41*** | 0.00 | -0.04 | 0.14 | -1.70*** | 0.00 |
| Leg | 1.87 | 0.21 | 2.07*** | 0.17 | -2.45*** | -0.76 | 1.51 | -0.17 | -2.45** |

# Conclusions

- There are trade-offs between conventional and RWA chicken products
- Consumers see products as substitutions but tend to stay within the same production method