

# Restaurant Disclosure of Food Allergens in the Tourism Context: A Croatian Case Study

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European Union Center  
Seminar Series  
May 7, 2021

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Restaurant Disclosures of Food Allergens  
in the Tourism Context: A Croatian Case Study



Join A. Bryan Endres, Professor of Agricultural and Consumer Economics, as he discusses the disclosure of food allergens by restaurants.

The research presented in this talk examines the performance of the restaurant industry in leading tourist destinations in Croatia with respect to self-disclosure of potential food allergens and strategies for improved food allergen communication beyond regulatory minimums.

MAY 7, 2021 - 12 PM CDT  
ZOOM MEETING ID: 812 5735 2886  
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New institutional agreement (June 2020)

*Sustainable Development: International Perspectives and Local Circumstances*

- Green Economy (sustainable and smart cities)
- Sustainable Tourism (economic, social and environmental impacts)
- Rural Tourism and Regional Development
- Food (marketing and sustainability)
- Other suggestions?



*Restaurant disclosure of food allergens: Analysis and economic implications*, Tourism & Hospitality Research (2021) Vol. 21(2) 202-215

- Motivation
- Legal/Regulatory Background
- Framing the Research question
- Methodology
- Analysis/Initial Findings
- Industry Recommendations
- Future Research



# Motivation

- Regulation of food labels and marketing
- Understanding EU-US policy variations
- Food allergies or other reactions
  - Self-diagnosis: 20-30%
  - Clinical test: 1-2% adults; 5-8% children

*Father of girl who died of allergy on plane blames Pret a Manger*

<https://www.theguardian.com/society/2018/sep/24/father-of-girl-who-died-of-allergy-on-plane-blames-pret-a-manger>

*Pret a Manger recorded nine allergic reactions to sesame in year before teenage girl died, inquest told*

<https://www.scmp.com/yp/discover/news/global/article/3056625/pret-manger-recorded-nine-allergic-reactions-sesame-year>



# A Comparative View of Allergens



United States



- ~~1. Celery~~
2. Cereals containing gluten (wheat, rye, barley, oats)
3. Crustaceans (prawns, crabs, lobsters)
4. Eggs
5. Fish
- ~~6. Lupin (legume similar to peanuts used in Mediterranean cuisine)~~
7. Milk
8. Shellfish
- ~~9. Mustard~~
10. Nuts
11. Peanuts
12. Sesame
13. Soybeans
- ~~14. Sulphur Dioxide and sulphites (>10 mg/kg)~~



European Union



1. Celery
2. Cereals containing gluten (wheat, rye, barley, oats)
3. Crustaceans (prawns, crabs, lobsters)
4. Eggs
5. Fish
6. Lupin (legume similar to peanuts used in Mediterranean cuisine)
7. Milk
8. Mollusks (mussels and oysters)
9. Mustard
10. Nuts
11. Peanuts
12. Sesame
13. Soybeans
14. Sulphur Dioxide and sulphites (>10 mg/kg)

## TITLE II—FOOD ALLERGEN LABELING AND CONSUMER PROTECTION

### SEC. 201. SHORT TITLE.

This title may be cited as the “Food Allergen Labeling and Consumer Protection Act of 2004”.

### SEC. 202. FINDINGS.

Congress finds that—

Food Allergen Labeling and Consumer Protection Act of 2004.  
21 USC 301 note.

21 USC 343 note.



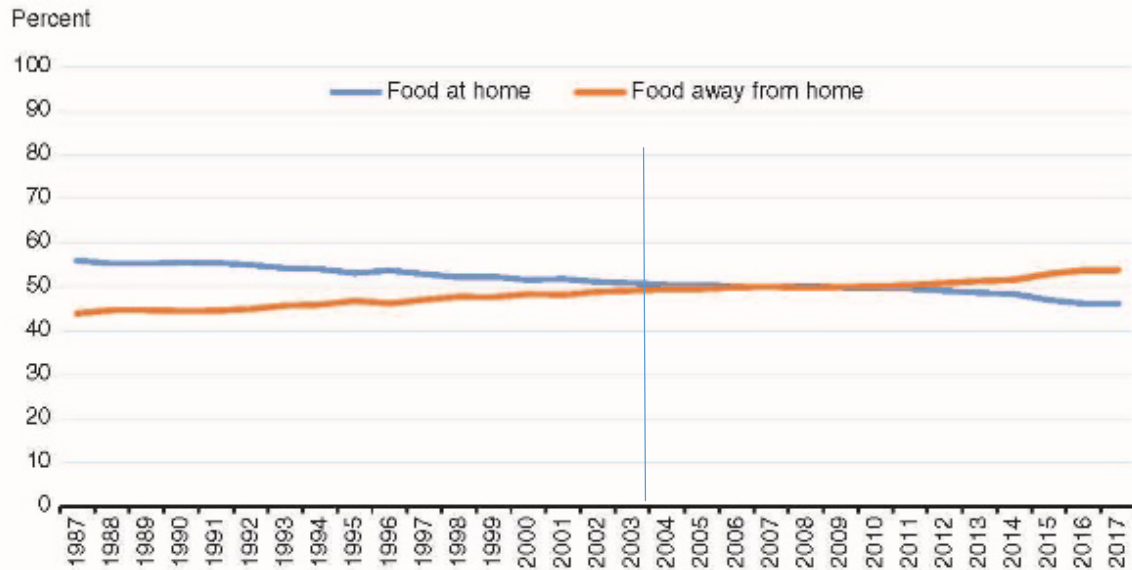
- Identified 8 major foods/food groups that account for 90% of allergens
- Public health
  - 30,000 Emergency Room visits
  - 150 deaths
- Amended Federal Food, Drug, and Cosmetic Act (package labels)
- Food Allergy Safety, Treatment, Education, and Research Act of 2021 (FASTER Act) added sesame



**DIRECTIVE 2003/89/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**  
**of 10 November 2003**  
**amending Directive 2000/13/EC as regards indication of the ingredients present in foodstuffs**  
**(Text with EEA relevance)**

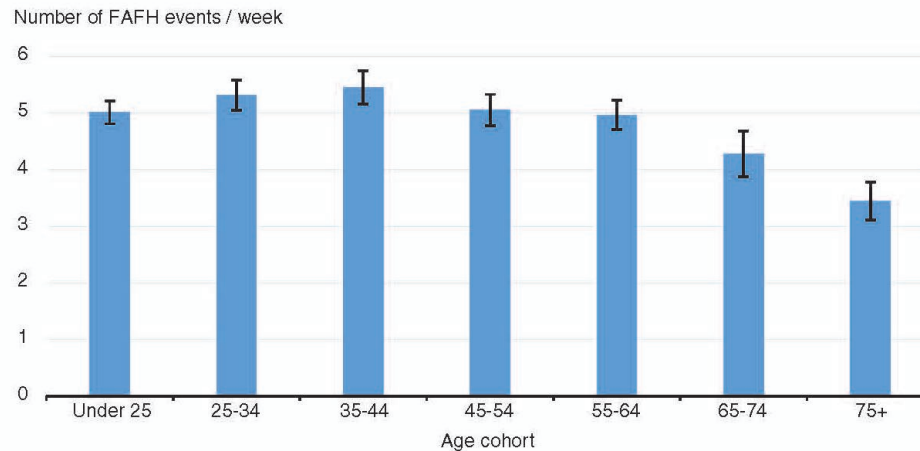
- Justification
  - Health protection
  - Guarantee consumers right to information
- Amended Directive 2000/13/EC (food labeling)
- Process for amending listed allergens based on evolving scientific knowledge
- Includes alcoholic beverages
- Milk “Contains milk” not necessary

## Relative shares of the two major food markets, 1987-2017



Source: USDA, Economic Research Service Food Expenditure Series.

## Weekly frequency of FAFH by adults by age group



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.

Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.



# Restaurants & Food Allergens

- Greatest risk is in non-pre-packaged foods
  - 74% of allergen incidents
- Employee education and training
  - Lack of awareness of allergens (Crowover, 2018)
  - Disclosure and cross-contamination training (Bailey et al., 2017; Kronenberg, 2012)
  - Motivation to learn/change (Lee & Sozen, 2016)
- Misconceptions
  - Drinking water can dilute (Ajuja & Sicherer, 2007)
  - Cooking eliminates (Common et al., 2013)
  - Small amounts harmless; can remove after prep (Common et al., 2013)
- Disclosure Errors (leach et al., 2005)
  - 21% of “peanut free” restaurant meals contained peanuts
  - 11% included specific assurance to customer that meal was peanut free

# Information Asymmetry & Economic Theory

- Uncertainty generated by asymmetric information can lead to market failure
  - George Akerlof (Nobel Prize, 2001)
    - “The Market for Lemons: Quality Uncertainty and the Market Mechanism”
- Less than efficient market outcomes in which consumers purchase less/pay more for a product
  - Lusk (2013)
- Presence of food allergens = information asymmetry
  - Consumers with allergens avoid restaurants or consume less than would otherwise maximize consumer welfare (and restaurant profit)
- Government response
  - Education
  - Standards for marketing claims
  - Mandatory labels

REGULATION (EU) No 1169/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 25 October 2011

on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004

(Text with EEA relevance)

- Extended allergen labeling to non-prepackaged foods
  - Restaurants, cafes, etc.
  - Affirmative obligation, subject to national exceptions
- Requirements
  - Written; easily visible; technology (e.g., QR code)
  - Point of sale
  - Verbal allowed if:
    - Conspicuously placed notice to ask
      - Meaningless and no better than “may contain” labeling (Barnet, 2017)
    - Information available before food offered

# Economics of Disclosure

- EU Restaurant Rule
  - 1.4 million restaurants; 6.4 million staff
  - Commission did not have cost data
    - Information burden on suppliers
    - Menu modifications (seasonality; fresh market)
    - Production costs
      - Cross-contamination prevention procedures and equipment
      - Slower kitchen production line
      - Increased cleaning
  - Assumed costs < public health benefits
- Information ≠ More Options

Sources: HOTREC (2013); Commission (2008); Bailey et al. (2011); Boyd (2018); Barnet (2017)

# Compliance vs. Nudge

- Use regulatory nudge to create competitive advantage (Bird & Park, 2017)
  - Industries reliant on discretionary spending with high rivalry (Rhou et al, 2016)
  - Move beyond generic/ubiquitous “may contain” or “ask your server” strategy
- Affirmative disclosure
  - Allergens as “experience” attribute → “search” attribute
  - AllergyEats.com



# Economics of the Veto Vote / Group Effects

- Accommodating diners with food allergens can increase restaurant profitability by up to 24% (Antico, 2015)
- People eat in groups
- 20-30% self-diagnose food allergens/sensitivity
- Individuals with allergen hold “veto” over group in restaurant selection
  - 10-15% of total diners impacted
  - Modest fixed expense (equipment)
  - Relatively low variable expenses (cleaning, training)
- \$225 million per week increase in total sales (Crownover, 2018)

# Initial Research Questions

- How would this “veto vote” apply in the tourism context?
- Do tourists with allergy concerns seek out restaurant information in advance when planning travel?
  - What sources of information?
- Could a concentration of “allergy friendly” restaurants provide a competitive advantage to a destination

<b>Year</b>	<b>Special Dietary Meals Served</b>	<b>Location</b>
2005	52,000	Disney World
2009	192,000	Disney World
2012	625,000	Disney World and Disneyland

Source: Antico, 2015

# Initial Research Objective

- Assess the extent of food allergy disclosures by restaurants in the leading tourist destinations in Croatia





# Data & Methodology

- 43 Locations
  - Highest intensity of tourism traffic
    - 10 towns/municipalities
    - 13 islands
  - Capital cities of 20 counties (županija)
- Mimic search characteristics of potential tourists
  - Limited to information available on-line (Burgess et al., 2011)
    - Restaurant websites
    - Online menus
    - Social media reviews
  - English and Croatian



ZAGREB	PAG	LASTOVO	POŽEŠKO - SLAVONSKA (POŽEGA)
DUBROVNIK	HVAR	ZAGREBAČKA (ZAGREB)	BRODSKO - POSAVSKA (SLAVONSKI BROD)
SPLIT	BRAČ	KRAPINSKO - ZAGORSKA (KRAPINA)	ZADARSKA (ZADAR)
ROVINJ	RAB	SISAČKO - MOSLAVAČKA (SISAK)	OSJEČKO - BARANJSKA (OSIJEK)
ZADAR	KORČULA	KARLOVAČKA (KARLOVAC)	ŠIBENSKO - KNINSKA (ŠIBENIK)
POREČ	MURTER	VARAŽDINSKA (VARAŽDIN)	VUKOVARSKO - SRIJEMSKA (VUKOVAR)
UMAG	VIR	KOPRIVNIČKO - KRIŽEVAČKA (KOPRIVNICA)	ISTARSKA (PAZIN)
OPATIJA	UGLJAN	BJELOVARSKO - BILOGORSKA (BJELOVAR)	DUBROVAČKO - NERETVANSKA (DUBROVNIK)
PULA	MLJET	PRIMORSKO - GORANSKA (RIJEKA)	MEĐIMURSKA (ČAKOVEC)
MEDULIN	PAŠMAN	LIČKO - SENJSKA (GOSPIĆ)	GRAD ZAGREB (ZAGREB)
KRK	ŠOLTA	VIROVITIČKO - PODRAVSKA (VIROVITICA)	

# Data & Methodology



- 973 restaurants
  - Top 20 rated restaurants in Trip Advisor
  - Top 20 rates restaurants in Google
    - “best restaurant in [insert city/island/county]”
- Analysis of degree and type of allergen disclosure
  - Restaurant websites (English and Croatian)
    - Manual reading & clicking (not web scraping) to replicate efforts of typical tourist
    - General websites and posted menus (if available)
  - Trip Advisor and Google Reviews
    - Used embedded search function to locate references to food allergies
    - Coded reviews as positive, negative, both, and restaurant responses

# The Search Team

- Victoria Anagnostopoulos
- Nikola Dokic
- Katherine Koehler
- Brian Lapham
- Ella Liskiewicz
- Arijana Sovsic
- Damir Vucicevic



<b>VARIABLE NAME</b>	<b>VARIABLE DESCRIPTION</b>	<b>Total Obs.</b>	<b>Missing Obs.</b>	<b>Zero Obs.</b>	<b>Positive Obs.</b>
Location	String	973	/	/	973
Restaurant	String	973	/	/	973
Website	String	973	122	/	851
Email	String	973	389	/	584
Trip Advisor Ranking	Numerical	973	68	/	905
Google Ranking	Numerical	973	61	/	912
Explicit Statement Regarding Food Allergens on English Website	Binary	973	/	962	11
Number of Any Allergens Identified in Menu Items on English Website	Numerical	973	/	960	13
Explicit Statement Regarding Food Allergens on Croatian Website	Binary	973	/	966	7
Number of Any Allergens Identified in Menu Items on Croatian Website	Numerical	973	/	966	7
Menu in English	Binary	973	/	758	215
Allergen Disclosure Statement on English Menu	Binary	973	758	201	14
Complete List of Meal Ingredients on English Menu	Binary	973	758	181	34
Lists Allergen Names on English Menu	Binary	973	758	198	17
Allergens Free Part of English Menu	Binary	973	758	207	8
Number of Restaurants Disclosing 14 Allergens in Allergy Friendly English Menu	Numerical	973	965	/	8
Menu in Croatian	Binary	973	/	679	294
Allergen Disclosure Statement on Croatian Menu	Binary	973	679	275	19
Complete List of Meal Ingredients on Croatian Menu	Binary	973	679	249	45
Lists Allergen Names on Croatian Menu	Binary	973	679	279	15
Allergens Free Part of Croatian Menu	Binary	973	679	286	8
Number of Restaurants Disclosing 14 Allergens in Allergy Friendly Croatian Menu	Numerical	973	965	/	8
Allergen Information in Social Media Reviews	Numerical	973	/	734	239
Restaurant within a Hotel	Binary	973	/	931	42

# Initial Findings

- Very few restaurant website specifically disclose food allergens
  - 1.3% English
  - 0.8% Croatian
- On-line posting of menus:
  - 22% provided English menus
    - 6.51% disclosed food allergens (14/215)
  - 30% provided Croatian menus
    - 6.46% disclosed food allergens (19/294)
- 8 restaurants (0.8%) provided on-line menus with specific allergy-friendly sections
  - English and Croatian versions

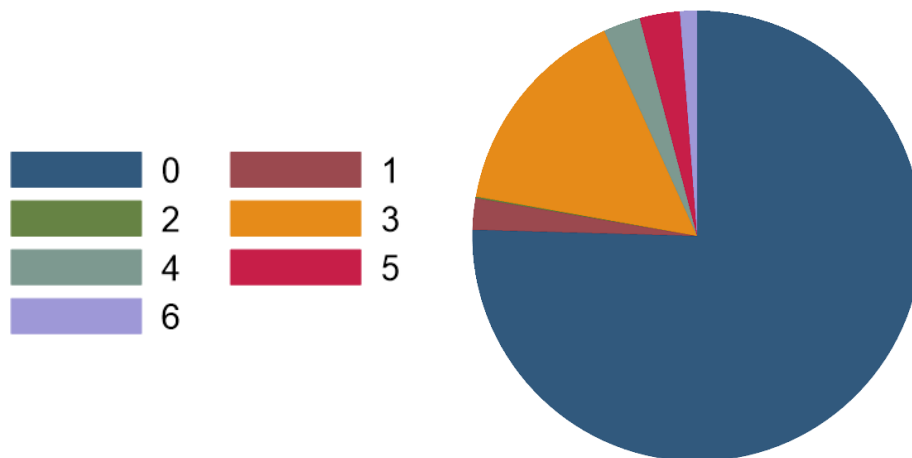
## Allergens

Beside every meal is number indicating allergen type which the meal contains.

- 1.Cereals containing gluten (wheat, rye,barley,oats, spelt,grains,kamut or their hybrids) and cereals products
- 2.Crustaceans and crustacean products
- 3.Eggs and egg products
- 4.Fish and fish products
- 5.Peanuts and peanut products
- 6.Soybeans and soy products
- 7.Milk and dairy products (including lactoze)
- 8.Nuts (almond,hazelnut,walnut)
- 9.Celery and celeriac products
- 10.Mustrad and mustrad products
- 11.Sesame seeds and sesame seed products
- 12.Garlic
- 13.Lupin and lupin products
- 14.Shellfish and their products

Restaurant Bococon, Punat, Krk

<b>Allergen Information in Social Media Reviews</b>	<b>Code</b>	<b>Frequency</b>	<b>Percent</b>
Allergens not mentioned	0	734	75.44
Negative comment	1	22	2.26
Restaurant response to the negative comment	2	1	0.10
Positive comment	3	150	15.42
Restaurant response to the positive comment	4	26	2.67
Mixed positive and negative comments	5	28	2.88
Restaurant response to mixed pos. and neg. comments	6	12	1.23
Total	/	973	100.00



# Missed Opportunities

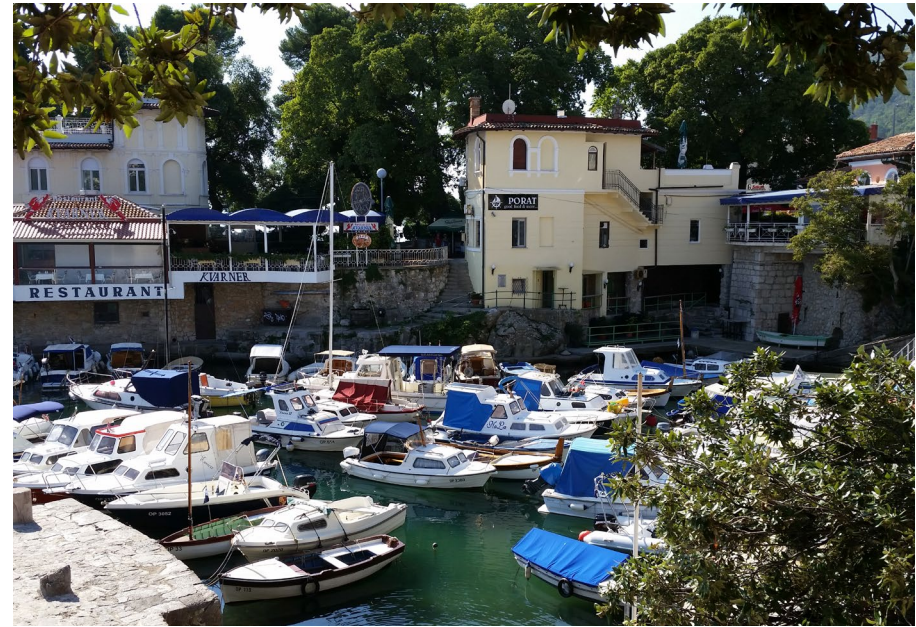
- Restaurant websites:
  - Rely on the “ask your server” regulatory minimum rather than disclose on the menu (or website)
- User Generated Social Media Content:
  - Customers care about allergens
  - 24.6% of social media reviews
    - 4 x restaurant self-disclosure
  - 3rd parties control the narrative
    - May not be accurate
    - May be more “trusted” than restaurant’s statements
  - Need to engage in social media
    - Improve response rate
      - 16.3% overall
      - 1/22 response to negative review
      - Signals lack of responsiveness to customer needs
  - Significant (positive) correlation between Google rankings and allergen information in social media



# Limitations & Further Research

- Low number of website disclosures prevented statistically significant conclusions regarding increase (or decrease) in Google or Trip Advisor rankings
- Develop better understanding of barriers to affirmative disclosures (e.g., move away from “ask your server”) and social media engagement
  - Interviews/case studies
- Compare results with other major tourist destinations
- Identify policy options for enhanced disclosure
  - Government incentives
  - Region-based allergy-friendly initiatives
  - Allergy-friendly restaurant website

# *Thank You*



## *Restaurant disclosure of food allergens: Analysis and economic implications, Tourism & Hospitality Research (2021) Vol. 21(2) 202-215*

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