



PARMA
SUMMER SCHOOL
26 – 28 SEPTEMBER 2023

Innovative food products

Attitudes towards science and food innovation

Neophobia/Neophilia case studies

MONTAÑA CÁMARA and VIRGINIA FERNÁNDEZ RUIZ
Nutrition and Food Science Department, University Complutense of Madrid (UCM), Spain.



ALIMNOVA UCM Research Group.

PARMA
SUMMER SCHOOL

Innovative food products

Novel Foods. *Scientific, technological and social aspects*

- **Research Topics:**
- *Characterization of the nutritional, sensorial and technological quality of new foods and food ingredients.*
- *Social aspects of new foods and food ingredients:*
 - *Compliance*
 - *Food scientific culture*
 - *Consumer science*



<https://www.ucm.es/alimnova/>





PARMA
SUMMER SCHOOL
26 – 28 SEPTEMBER 2023

Innovative food products

Attitudes towards Science and Food Innovation

Montaña Cámara
Nutrition and Food Science Department, Pharmacy, UCM



Factors influencing the attitudes towards science and food innovation

PARMA
SUMMER SCHOOL

Innovative food products

Scientific literacy

Public understanding of science

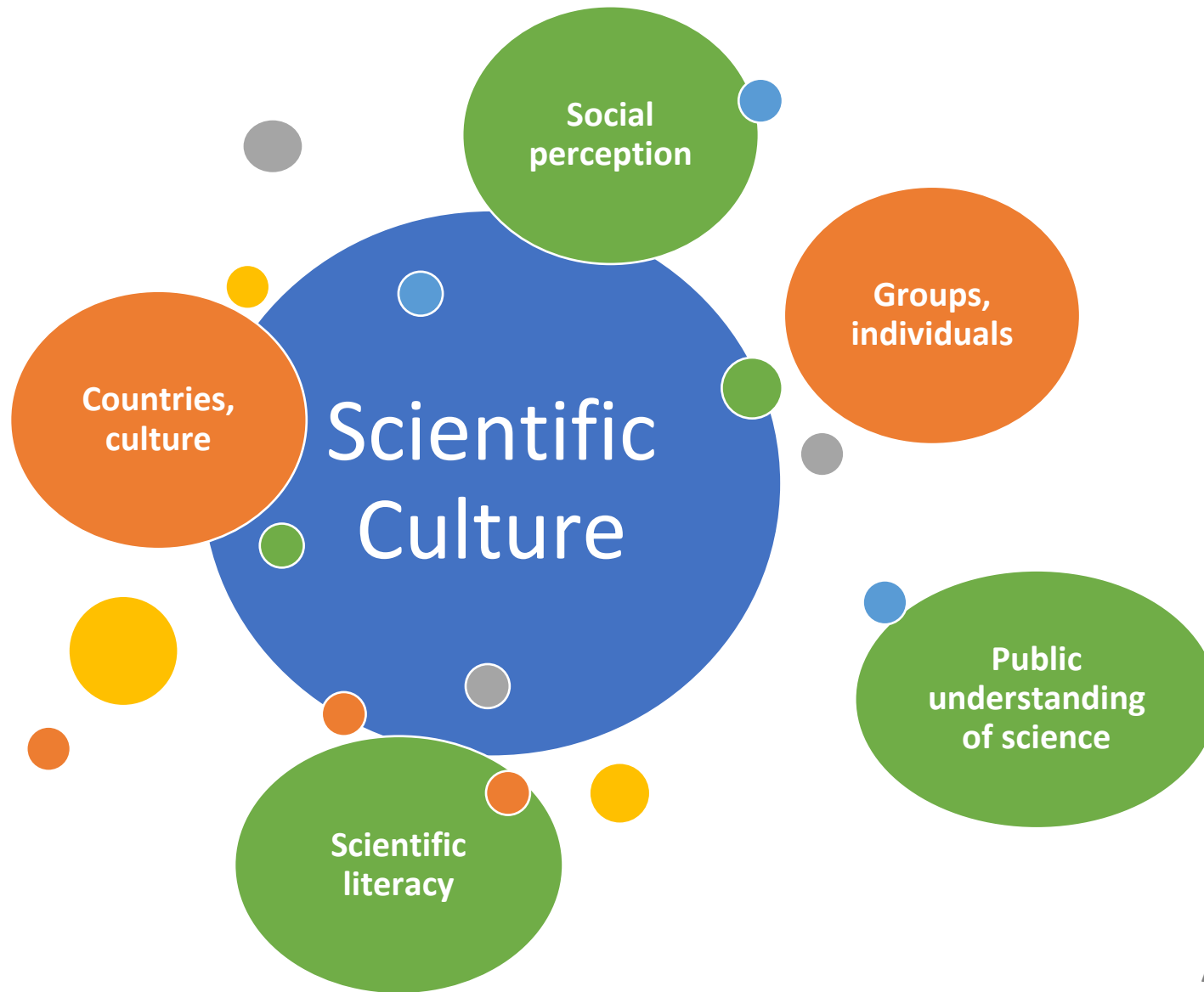
Public perception of science

Public awareness

Scientific culture

Social appropriation of Science



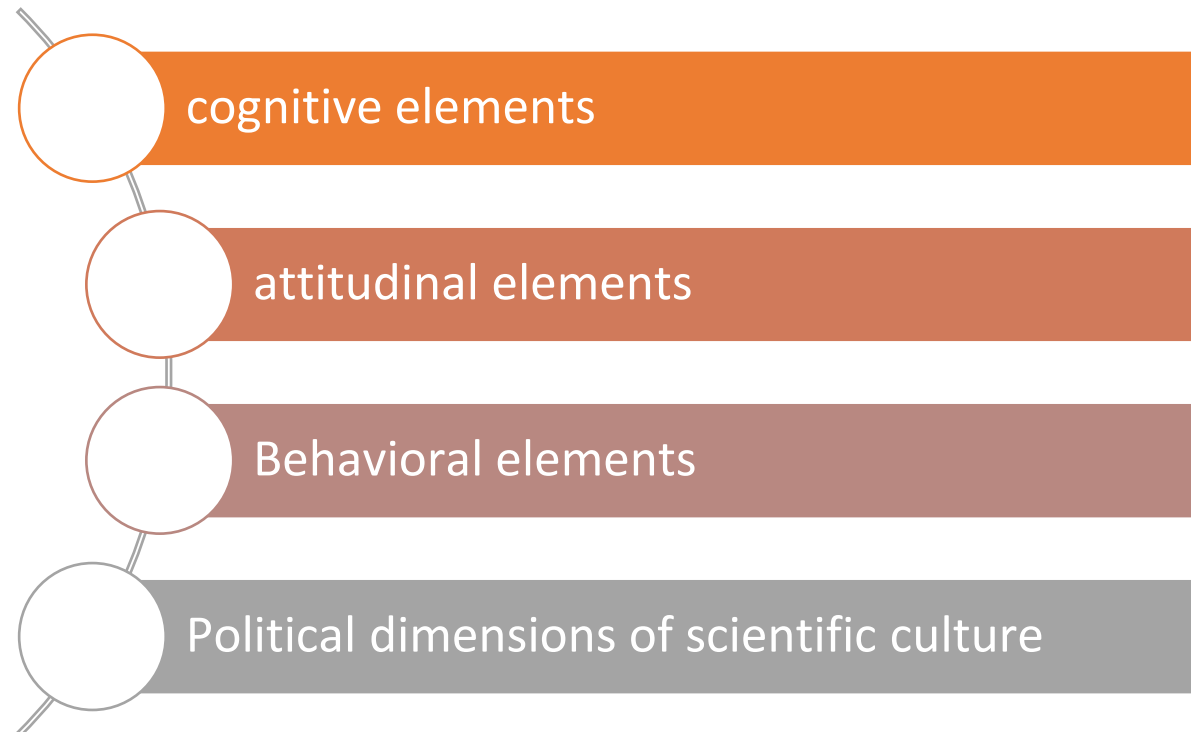


Alonso, C. 2017

SCIENTIFIC LITERACY

It is a functional literacy, which allows the person to use scientific concepts, procedures and values in the decision making process.

MULTIDIMENSIONAL MODEL



SCIENTIFIC FOOD CULTURE

It allows the person to daily apply the information on food safety and to take informed decisions regarding food.

Citizens' knowledge on food issues should be understood as part of **scientific literacy and social understanding of science**.



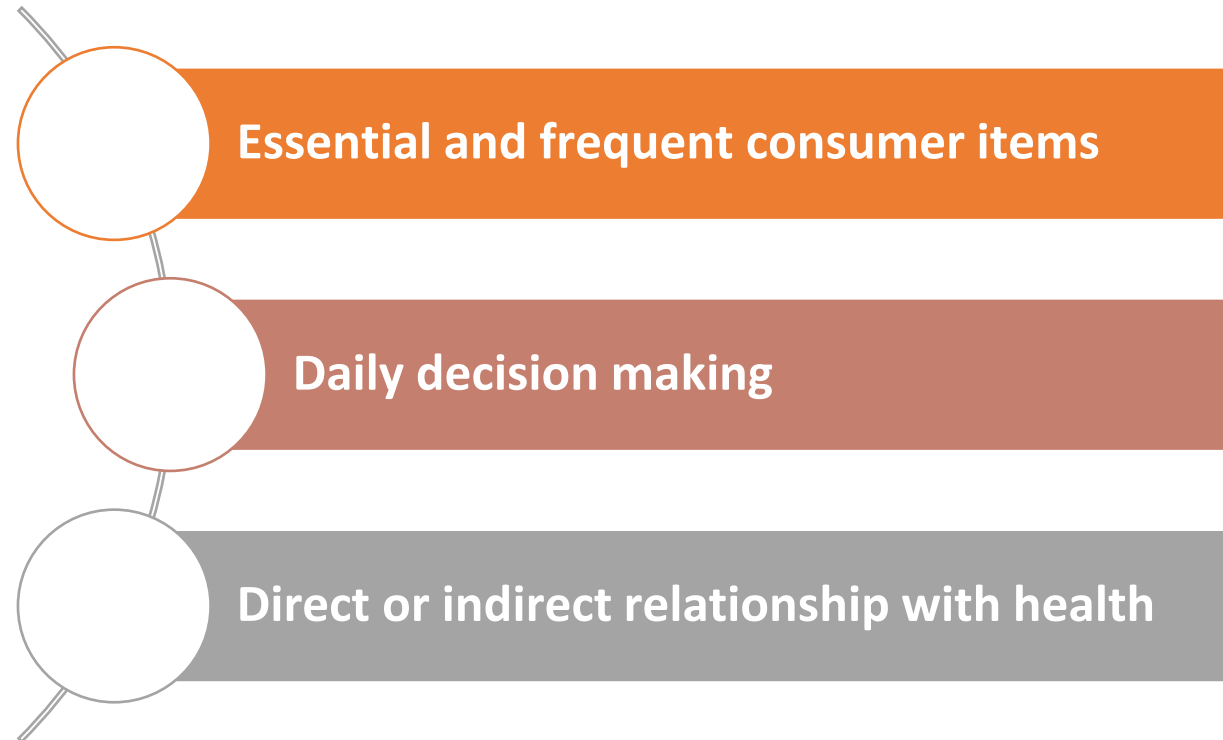
(Alonso et al., 2019)

CONSUMERS ATTITUDES RELATED TO FOOD PRODUCTS

PARMA
SUMMER SCHOOL

Innovative food products

Feeding is the conscious act that we perform most frequently



PERCEPTION

Citizens' interest in science, technology, food and health exists, and institutions and governments are no strangers to it, both at the national level (FECYT, 2021) and internationally (EFSA, 2022; F BBVA, 2023).



Decisions related to food, eating habits and food choices.

Interest and consumption of Information declared on scientific topics (FECYT, 2022)

Interés por los temas científicos y tecnológicos | Espontáneo

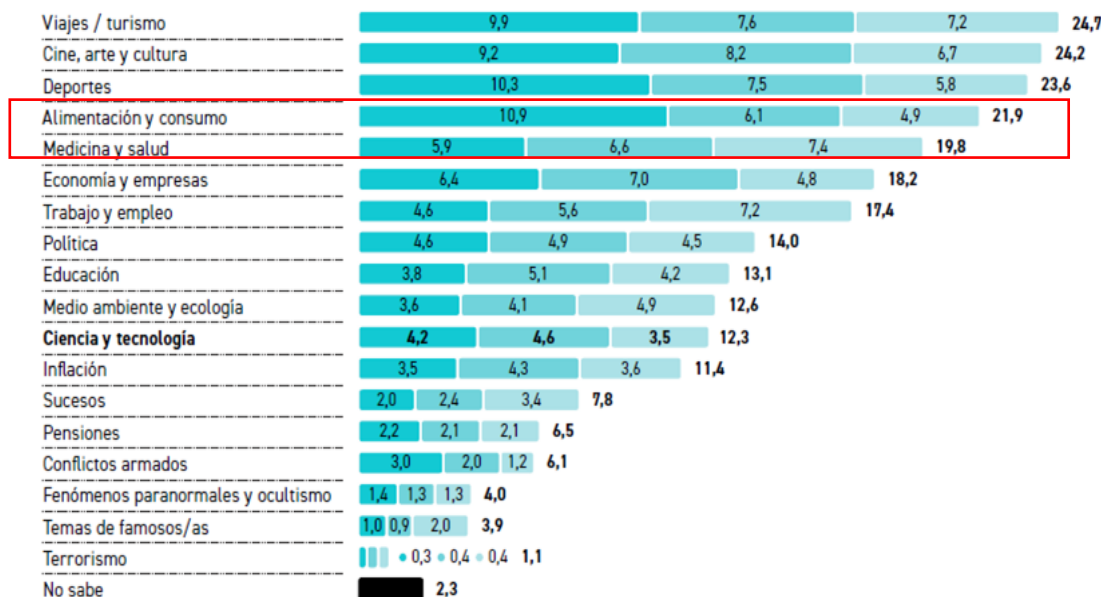


A diario recibimos informaciones y noticias sobre temas muy diversos. Dígame por favor tres temas sobre los que se sienta especialmente interesado/a.

Cifras en porcentaje sobre el total.

LEYENDA:

1ª CITA 2ª CITA 3ª CITA Total



ENCUESTA DE PERCEPCIÓN SOCIAL DE LA CIENCIA Y LA TECNOLOGÍA 2022 | FECYT

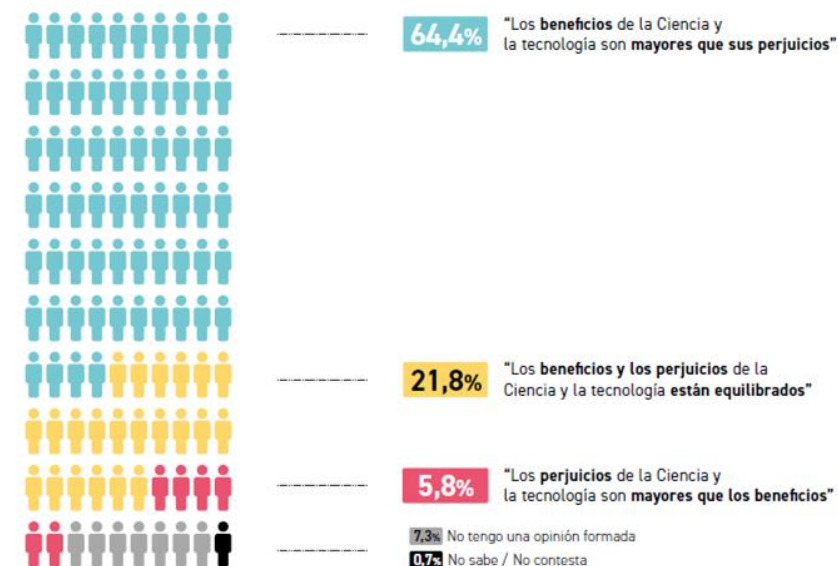
BASE: Total de personas entrevistadas (n=6.054)

Balace de la Ciencia y la tecnología



Si tuviera Ud. que hacer un balance de la Ciencia y la tecnología teniendo en cuenta todos los aspectos positivos y negativos, ¿cuál de las siguientes opciones que le presento reflejaría mejor su opinión?

Cifras en porcentaje sobre el total.



Interest and consumption of Information declared on scientific topics (F BBVA, 2023)

El nivel de interés declarado acerca de los temas científicos es medio alto, mientras que la percepción de sentirse informado acerca de los mismos es ligeramente menor.

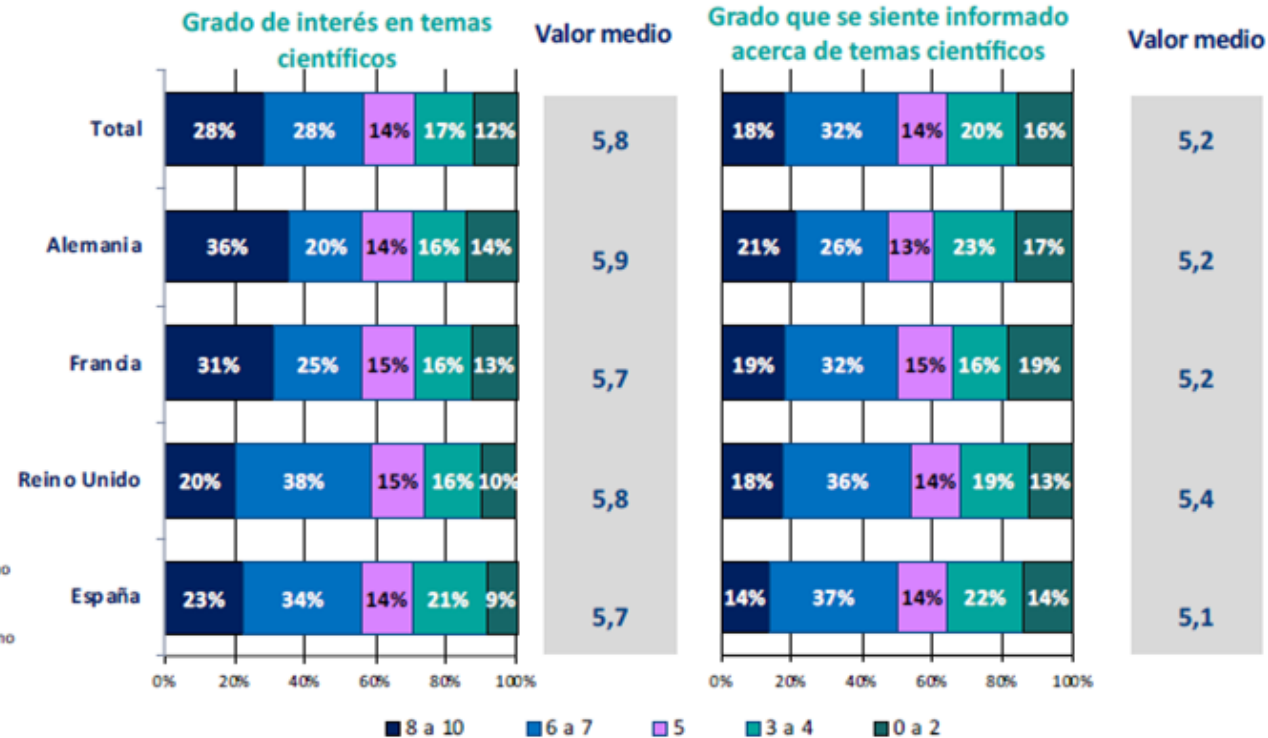
Me gustaría que me dijera cuál es su grado de interés acerca de cada uno de los temas que le voy a leer

¿Y en qué medida se considera usted informado acerca de estos mismos temas?

Distribución y media en una escala de 0 a 10, donde 0 significa que no le interesa nada y 10 que le interesa muchísimo.

Distribución y media en una escala de 0 a 10, donde 0 significa que no se siente nada informado y 10 que se siente muy informado

Base: 6.000 casos



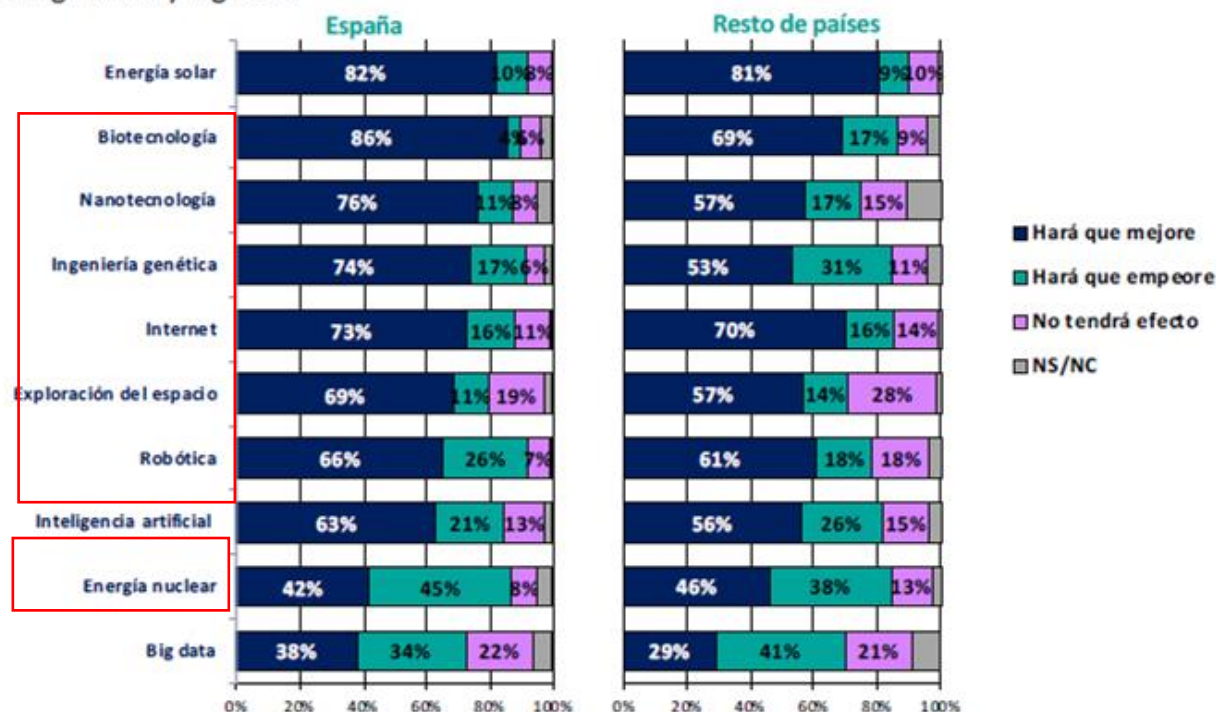
Expectativas hacia la ciencia

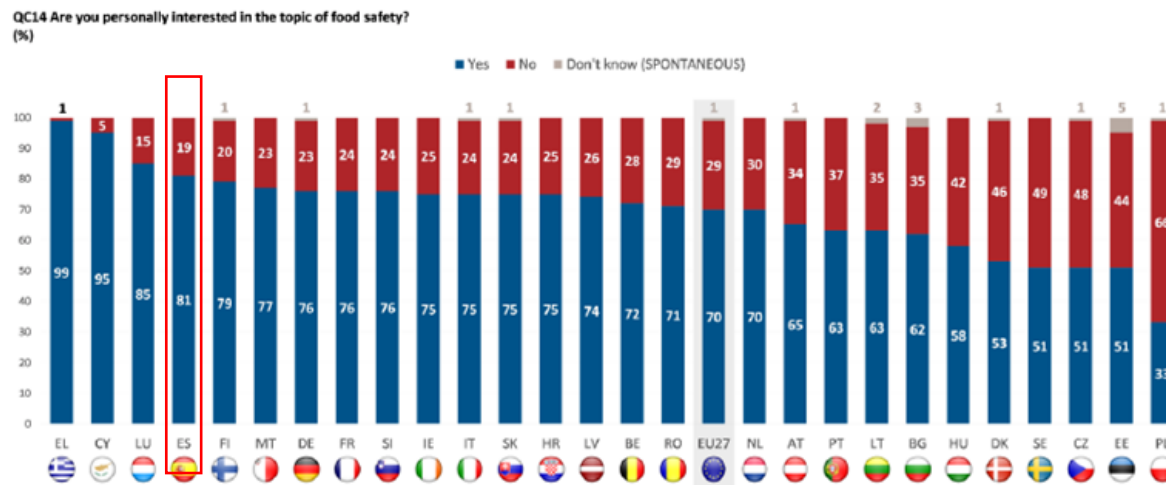
Las expectativas hacia diferentes tecnologías y aplicaciones científicas son predominantemente positivas. Las áreas que suscitan mayor división y valoración crítica críticas son la energía nuclear y el Big data.

Los españoles expresan expectativas más favorables que el resto de países en casi todas las áreas, destacando significativamente en las áreas de la nanotecnología, la ingeniería genética y Big data.

"Voy a leerle una lista de tecnologías y aplicaciones científicas. Le rogaría que me dijera, para cada una de ellas, si cree usted que esa tecnología o aplicación científica hará que mejore, empeore o no tendrá efecto sobre nuestra vida".

Base: 6.000 casos



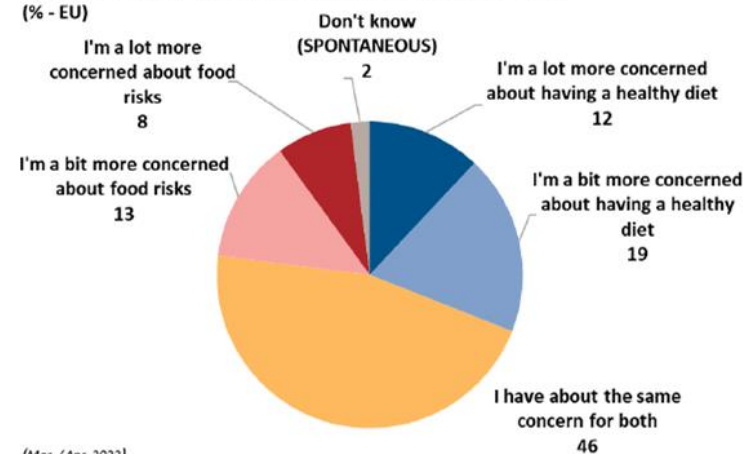


Interest in Food Safety / Healthy Diets

En el conjunto de la UE:

- 70 % están personalmente interesados en el tema de la seguridad alimentaria
- 29% no están interesados
- 1% dice que no sabe.

QC6T Please take a moment to think about your answers to the previous questions about having a healthy diet and about food risks. How does your concern about having a healthy diet compare to your concern about food risks? (% - EU)

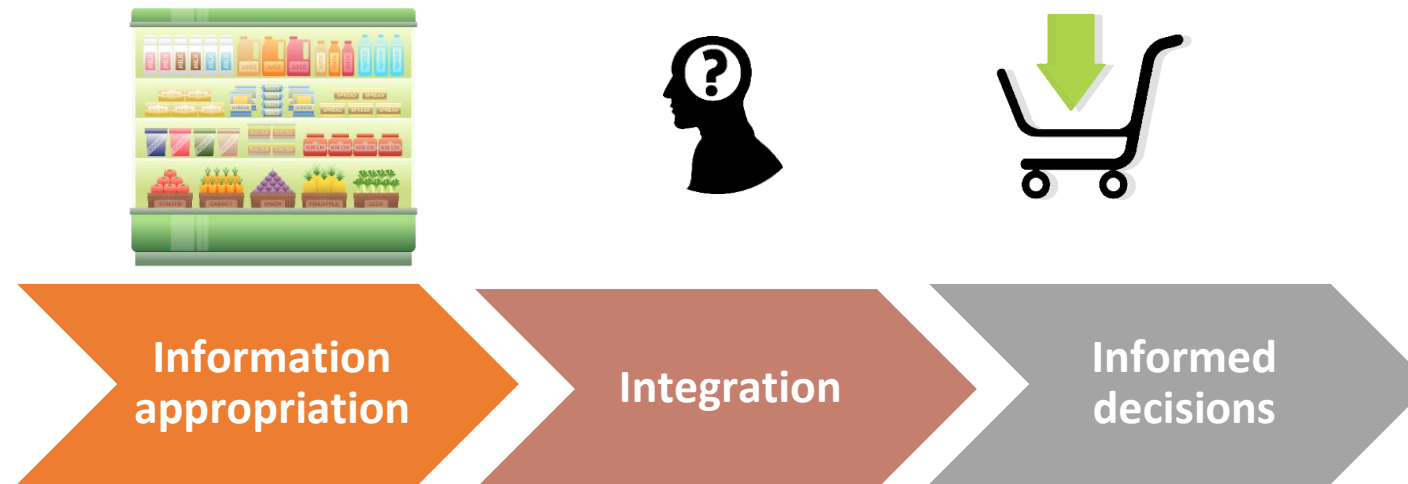


(Mar./Apr. 2022)

FROM PERCEPTION TO ACTION....

APPROPRIATION OF SCIENTIFIC FOOD CULTURE

The ideal scenario is one in which consumers present a base of scientific culture that allows them to apply information related to food safety in their daily lives and helps them make informed decisions in relation to the foods they buy and consume..



Cristina Alonso, 2017; Benjamin Shen, 2021; Jonh Miller 2021

FROM PERCEPTION TO ACTION.... “The frustrating paradox”



Consumer Behavior
The Elusive Green Consumer
People say they want sustainable products, but they don't tend to buy them. Here's how to change that. by Katherine White, David J. Hardisty, and Rishad Habib
From the Magazine (July-August 2019)



Recommendations to companies:

- use social influence,
- form good habits,
- take advantage of the domino effect,
- speak with the heart/brain
- favor experiences in front of/on the property.

Acceptance of innovation in food and health

-> communication skills of experts and industry

PARMA
SUMMER SCHOOL

Innovative food products



Gencat.

22nd Annual
FOOD  **INNOVATE**
Part of **FOOD WORLD** 20-21 June 2024 | Madrid **SUMMIT**





SCIENCE, TECHNOLOGY AND SOCIETY

<https://cts.grupos.uniovi.es/inicio>

José Antonio López Cerezo.

PhD. Philosophy of Science



Universidad de
Oviedo

PARMA SUMMER SCHOOL

Innovative food products

Alonso Andicoberry, C.; Fernández Ruiz, V.; Cámara Hurtado, M.. Cultura alimentaria. El caso del etiquetado de los alimentos. Editorial Catarata, 2019.

Cámara Hurtado M, Laspra B, López Cerezo JA (2017) Apropiación social de la ciencia en España. FECYT (ed.) Percepción social de la ciencia y la tecnología en España 2016. España: FECYT.

Cámara, M, Cerezo, JA. "Political Dimensions of Scientific Culture: Highlights from the Ibero-American Survey on the Social Perception of Science and Scientific Culture." Public Understanding of Science. April, 21, 369-384, 2012.

Cámara, M; Muñoz van den Eynde, A; López Cerezo, JA. Attitudes towards Science among Spanish Citizens. The Case of Critical Engagers. Public Understanding of Science. 2018, 27, 6, pp: 690-707.

Laspra B, Muñoz E (eds.) (2014) Culturas científicas e innovadoras. Progreso social. Argentina: Eudeba.

Laspra B. (2015) Concepto y dimensiones de la cultura científica. Tesis Doctoral. Universidad de Oviedo.

López Cerezo J.A. y Cámara Hurtado M. (2009) Apropiación social de la ciencia y participación ciudadana. En: Cultura científica en Iberoamérica. Encuesta en grandes núcleos urbanos. FECYT, OIE y RICYT (Eds). FECYT, Madrid, pp. 81.

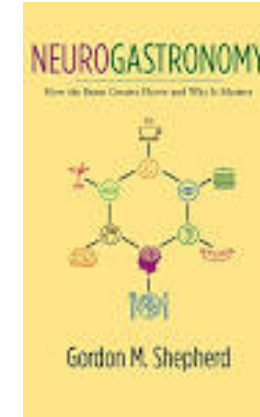
López Cerezo, JA.; Cámara, M. Scientific culture and social appropriation of the science. Social Epistemology. 21, nº1, 69-81 (2007).

Miller JD, Ackerman MS, Laspra B, Huffaker JS (2021) The acquisition of health and science information in the 21st century. The Information Society, 37(2), 82-98.



FUTURE STUDIES ABOUT FOOD INNOVATION DECISION MAKING

📖 NEUROGASTRONOMY



Gordon M. Shepherd (1933-2022)

📖 FOOD NEOPHOBIA STUDIES



Stay connected



Subscribe to

www.efsa.europa.eu/en/news/newsletters
www.efsa.europa.eu/en/rss



Engage with careers

www.efsa.europa.eu/en/engage/careers



Follow us on Twitter

@efsa_eu
@plants_efsa
@methods_efsa



PARMA
SUMMER SCHOOL
26 – 28 SEPTEMBER 2023

Innovative food products

Neophobia/Neophilia case studies

Virginia Fernández Ruiz

Nutrition and Food Science Department, Pharmacy, UCM



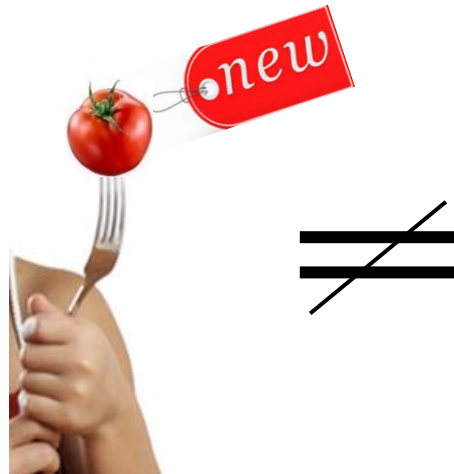
What is Food Neophobia?



Food Neophobia

The reluctance or avoidance to eat new or unfamiliar foods is called with the term **food neophobia**, a concept defined by Pliner and Hobden (1992) as *'distrust of eating and/or rejection of new foods or unknown'*

Food neophobia
(unfamiliar/new
foods)



Picking eating'
(familiar foods)



Food Neophobia

Remarkable **barrier** for aiming a **balanced diet**



Neophobic people tend to eat the **same types of food repeatedly** (Alley et al., 2011)



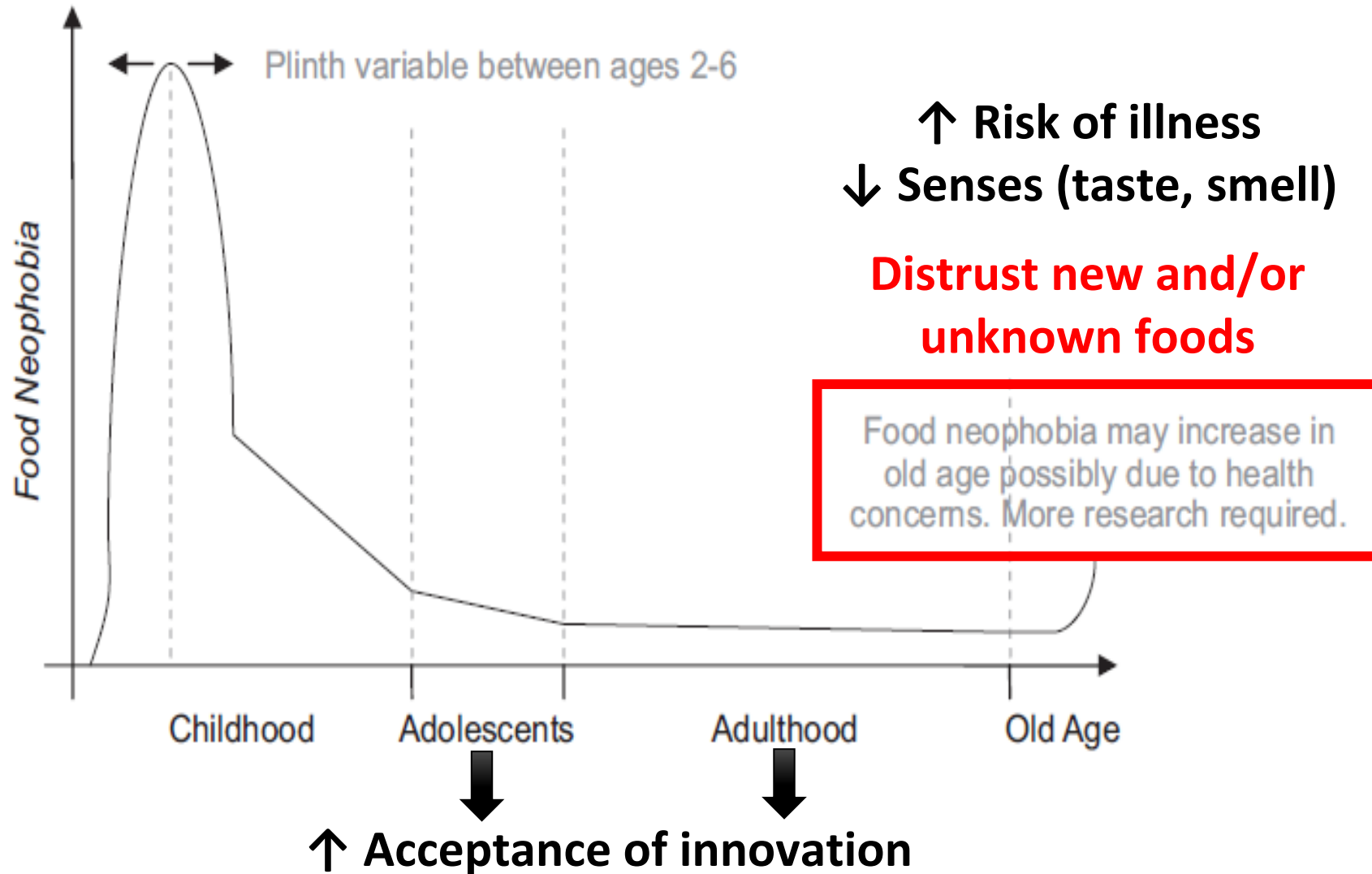
Serious **problems** of **public health and education**



Food neophobia has a **negative impact** in the **dietary intake** of both children and adults (Alley et al., 2011)



Food neophobia tends to decrease with **age** (Schnettler et al., 2017)



(Dovey et al., 2008)

Food Neophobia

Research in food neophobia was aided by using the **Food Neophobia Scale (FNS)**, a psychometric tool which provides with high precision a standardized measure of the consumers reluctance to try new foods.

1 Point (Strongly disagree)

7-point Likert scale

7 Points (Strongly agree)

Food Neophobia Scale (FNS)

1. I am constantly sampling new and different foods. (R)
2. I don't trust new foods.
3. If I don't know what is in a food, I won't try it.
4. I like foods from different countries. (R)
5. Ethnic food looks too weird to eat.
6. At dinner parties, I will try a new food. (R)
7. I am afraid to eat things I have never had before.
8. I am very particular about the foods I will eat.
9. I will eat almost anything. (R)
10. I like to try new ethnic restaurants. (R)

(Pliner and Hobden, 1992)

Food Neophobia

Participants completed the **FNS questionnaire**, which was translated into Spanish.

Food Neophobia Scale (English version vs Spanish version)

English items	Spanish items
1. (R) I am constantly sampling new and different foods	1. (R) Estoy constantemente probando alimentos nuevos y diferentes
2. I don't trust new foods	2. No confío en los alimentos nuevos
3. If I don't know what a food is, i won't try it	3. Si no conozco qué hay en un alimento, no lo pruebo
4. (R) I like foods from different cultures	4. (R) Me gustan las comidas de diferentes países
5. (R) At dinner parties, I will try new foods	5. (R) En fiestas con comida, pruebo nuevos alimentos
6. I am afraid to eat things I have never had before	6. Me da miedo probar alimentos que nunca he probado antes
7. I am very particular about the foods i eat	7. Soy muy especial con los alimentos que como
8. (R) I like to try ethnic restaurants	8. (R) Me gusta probar nuevos restaurantes étnicos

(Fernández-Ruiz et al., 2013)

Food Neophobia

Cronbach Alpha

Reliability of the FNS

PCA

Data obtained

Mixed model ANOVA
HSD Test Tukey

Effect of gender on food neophobia levels

Relationships between:

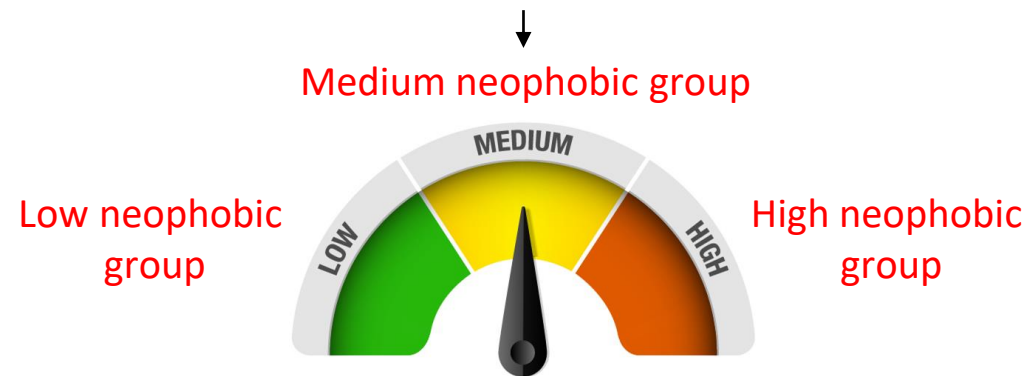
- Food neophobia level - degree of liking
- Food neophobia level - willingness to try

Food Neophobia

Mean scores and standard deviation of each FNS item and the total score in test.

Item	Mean ^a	S.D.
1	3.10	1.52
2	3.25	1.57
3	4.06	1.94
4	2.20	1.25
5	2.45	1.28
6	3.01	1.70
7	4.67	1.78
8	3.06	1.66
Total	25.80	7.75

Higher results
=
Higher level of Food Neophobia



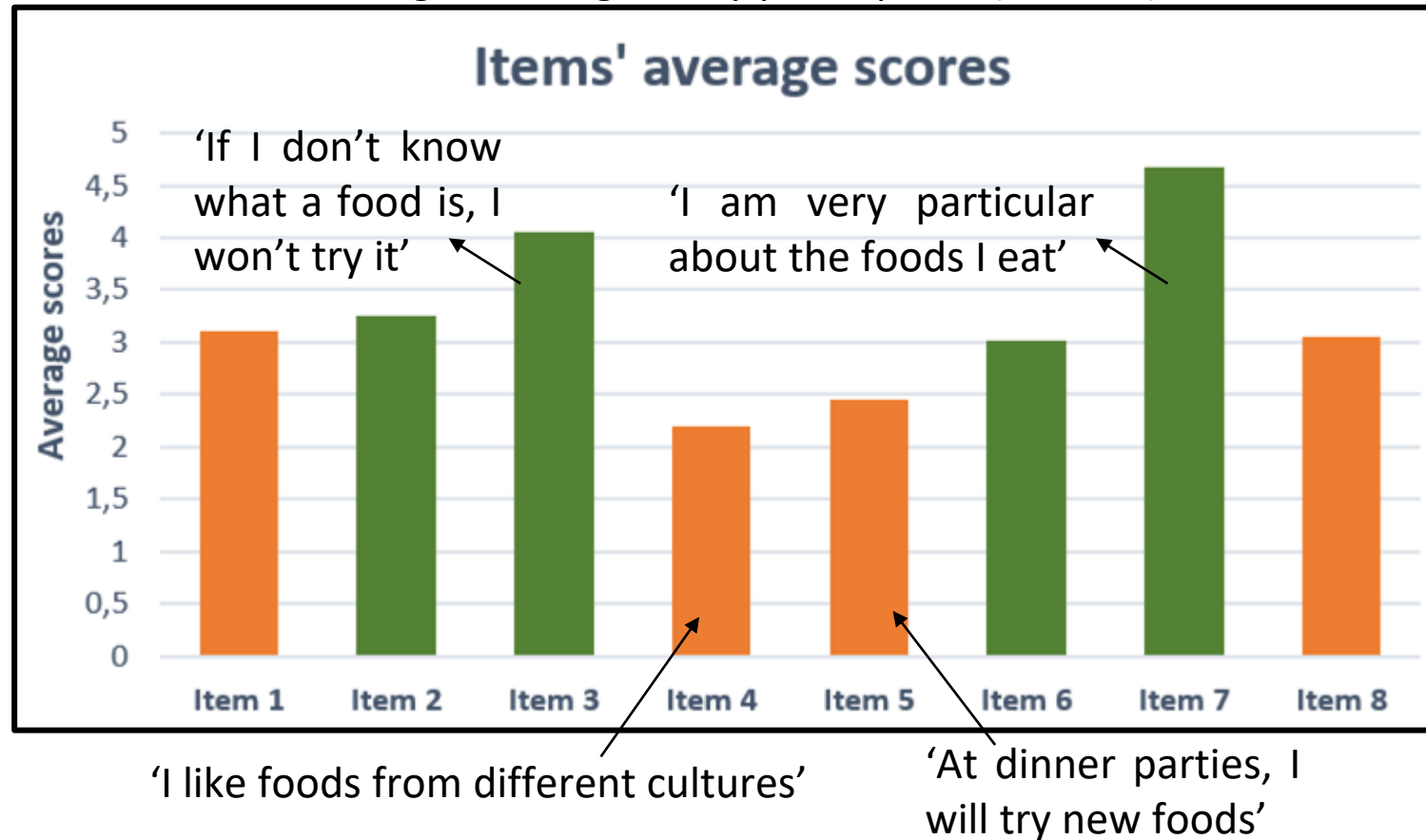
^a High results mean high levels of food neophobia (minimum value = 1; maximum = 7).

(Domínguez et al., 2019)

Food Neophobia

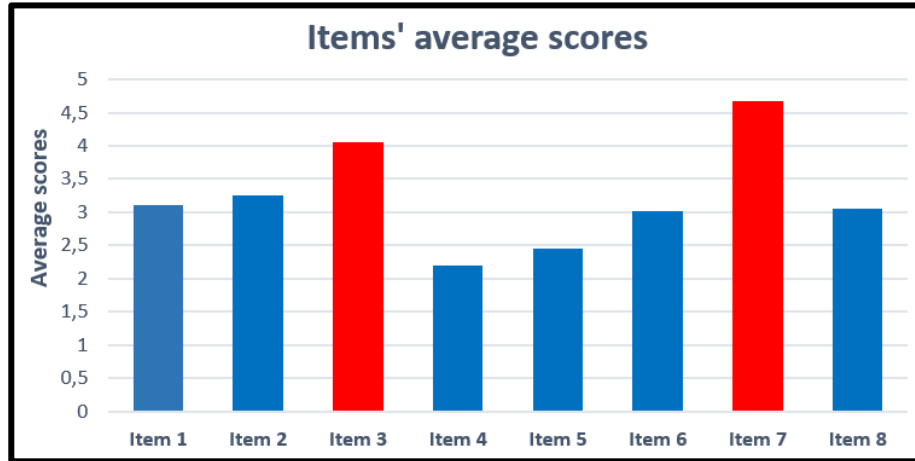
Reverse Items have lower scores than the **positive** ones.

Items average scores given by participants (N = 168)

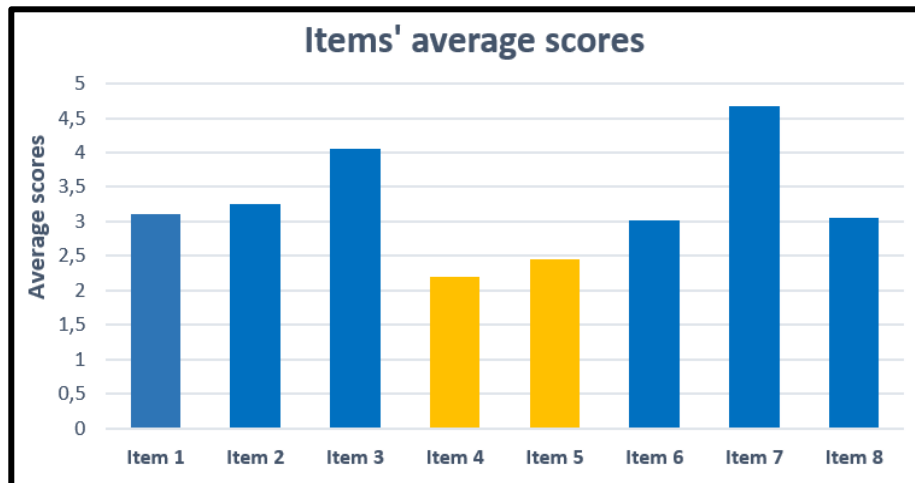


(Domínguez et al., 2019)

Food Neophobia



Even though participants are in certain degree reluctant to try new foods (**Items 3 and 7**),



They could be willing to **make an exception** when it comes to try ethnic food (**Item 4**) as well as when they are enjoying their leisure time like in dinner parties (**Item 5**).

(Domínguez et al., 2019)

Food Neophobia



Levels of Food Neophobia in Spanish young population

Reference	N	Age range (years)	Food Neophobia level
Fernández-Ruiz et al. 2013	70	25-36	29.12
Domínguez et al. 2019	168	19-35	25.80
Cámara et al. 2021	100	18-35	23.30
Current study	115	18-35	?

(Schnettler et al., 2017)

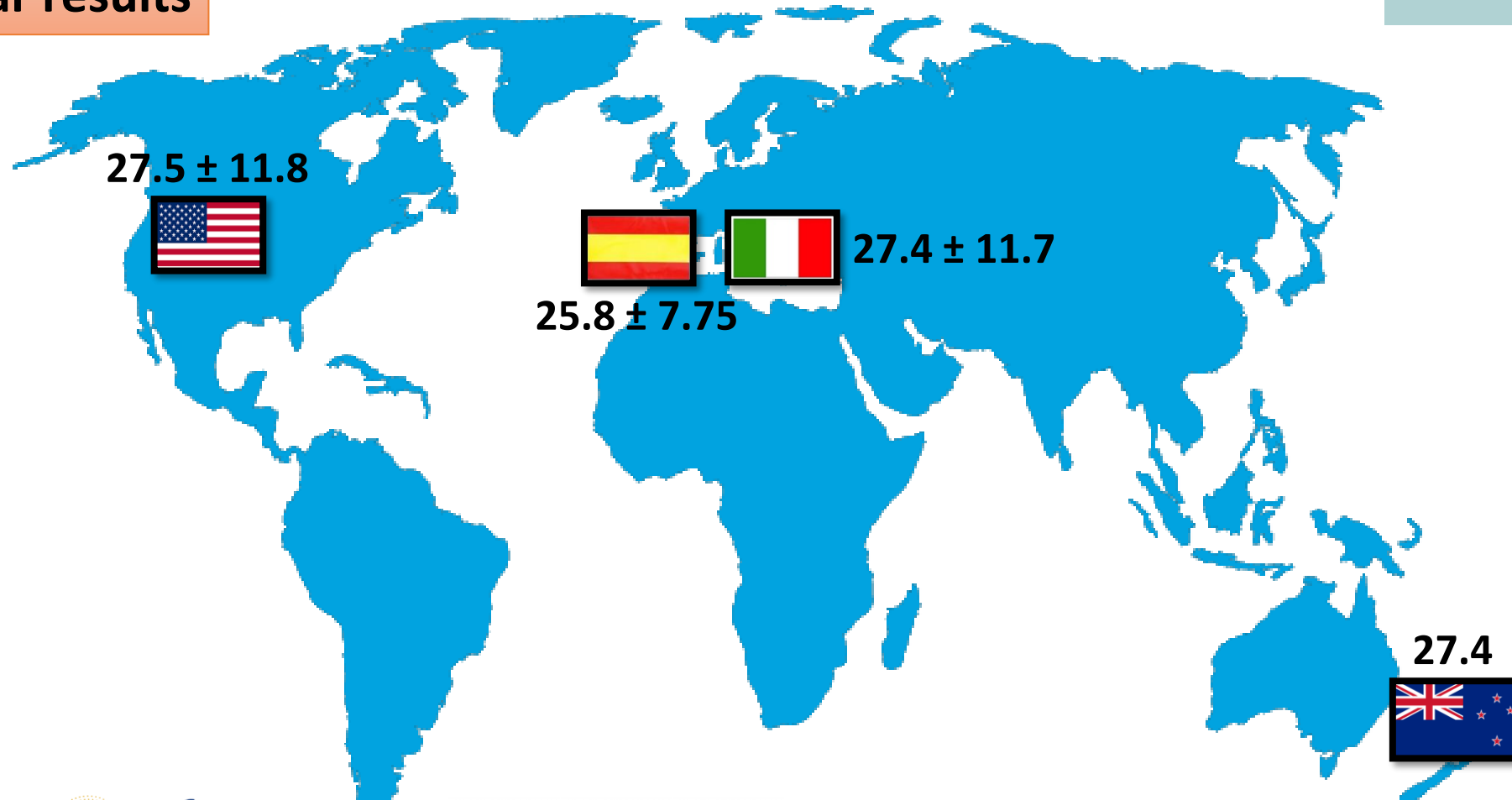
Food Neophobia



PARMA
SUMMER SCHOOL

Innovative food products

Similar results



SCHOOL OF ADVANCED STUDIES ON FOOD AND NUTRITION



UNIVERSITÀ DI PARMA



UNIVERSITÀ CATTOLICA del Sacro Cuore

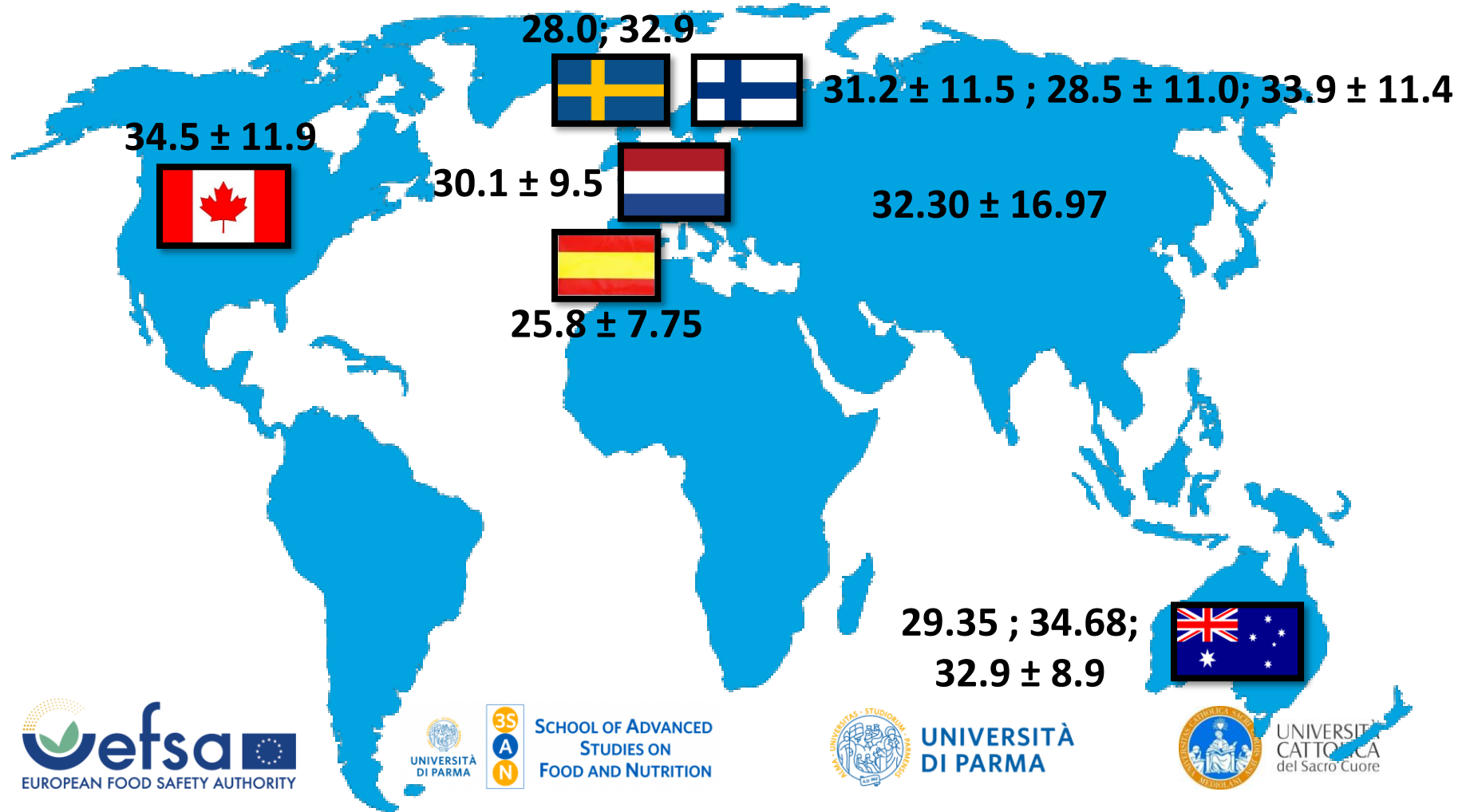
Food Neophobia



PARMA
SUMMER SCHOOL

Innovative food products

Higher results



SCHOOL OF ADVANCED STUDIES ON FOOD AND NUTRITION



UNIVERSITÀ DI PARMA



UNIVERSITÀ CATTOLICA del Sacro Cuore

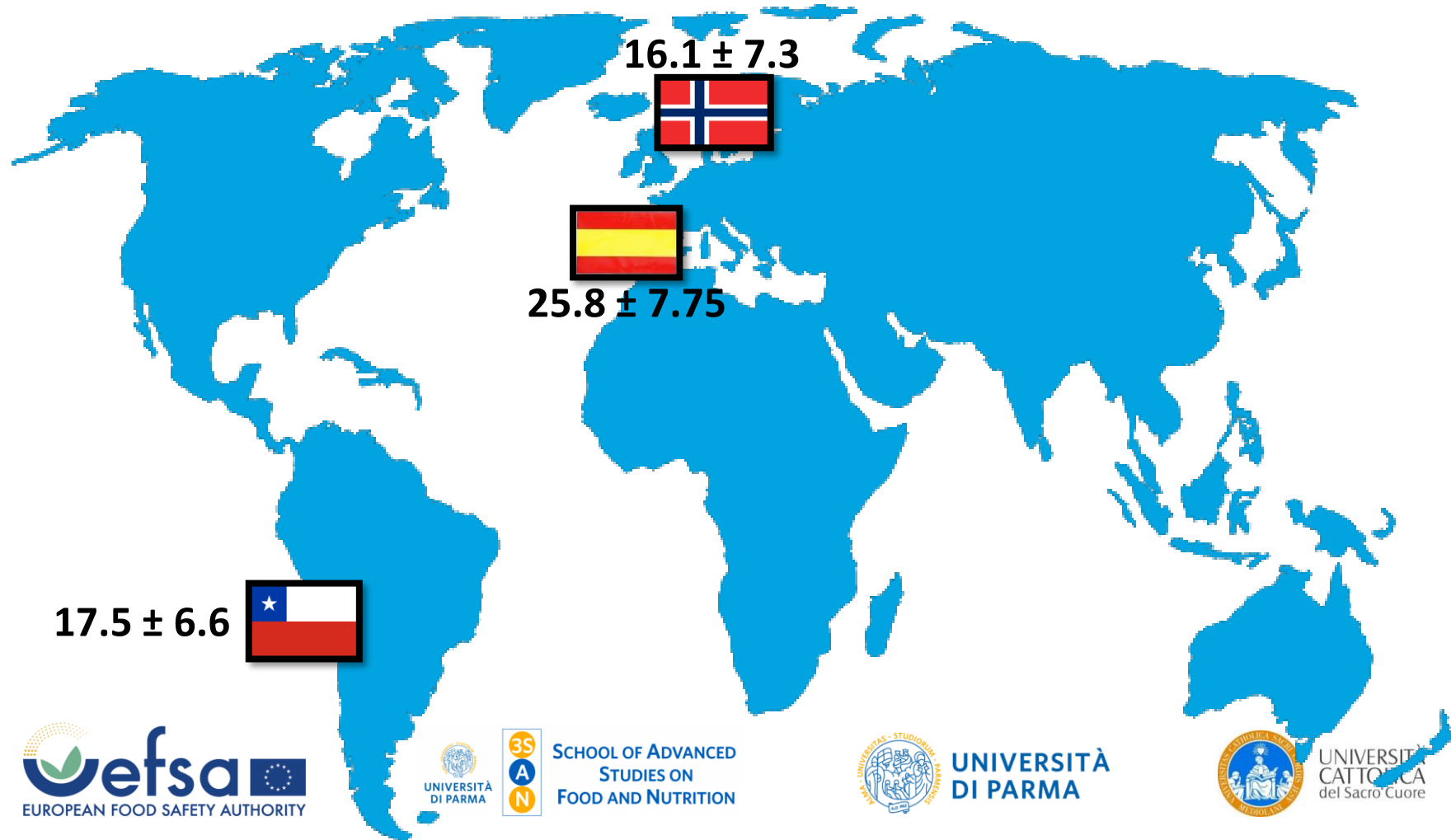
Food Neophobia



PARMA
SUMMER SCHOOL

Innovative food products

Lower results



SCHOOL OF ADVANCED STUDIES ON FOOD AND NUTRITION



UNIVERSITÀ DI PARMA



UNIVERSITÀ CATTOLICA del Sacro Cuore

(Domínguez et al., 2019)

Food Neophobia

- ✓ Food neophobia has a strong influence in the dietary choices and preferences and also in the acceptance of food innovation.
- ✓ Food neophobia is associated with serious problems of **public health and education** and it is considered a **remarkable limitation** for aiming a balanced diet.
- ✓ Information about Food neophobia can be use in the development of new food products in the food industry.

Acknowledgment

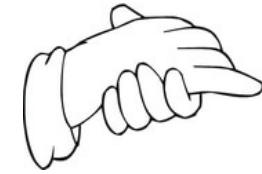
PARMA
SUMMER SCHOOL

Innovative food products

alimnova



UNIVERSIDAD
COMPLUTENSE
MADRID



PARMA SUMMER SCHOOL

Innovative food products



Thanks!!

References

Domínguez L, Fernández-Ruiz V, Sánchez-Mata MC, Cámara M, editors. Food neophobia: Spanish case study related to new formulations based on traditional 'gazpacho' 2019: International Society for Horticultural Science (ISHS), Leuven, Belgium.

Fernández-Ruiz V, Claret A, Chaya C. Testing a Spanish-version of the Food Neophobia Scale. Food Quality and Preference. 2013;28(1):222-5.

Pliner P, Hobden K. Development of a scale to measure the trait of food neophobia in humans. Appetite. 1992;19(2):105-20.

Rabadán A. Consumer attitudes towards technological innovation in a traditional food product: The case of wine. Foods. 2021;10(6).

Ritchey PN, Frank RA, Hursti U-K, Tuorila H. Validation and cross-national comparison of the food neophobia scale (FNS) using confirmatory factor analysis. Appetite. 2003;40(2):163-73.

Wendt M-C, Weinrich R. A systematic review of consumer studies applying the Food Technology Neophobia Scale: Lessons and applications. Food Quality and Preference. 2023;106:104811.

Stay connected



Subscribe to

www.efsa.europa.eu/en/news/newsletters
www.efsa.europa.eu/en/rss



Engage with careers

www.efsa.europa.eu/en/engage/careers



Follow us on Twitter

@efsa_eu
@plants_efsa
@methods_efsa

Rate each item with what you consider most appropriate in relation to food using a 7-point scale (1="strongly disagree"; 7="strongly agree")

Strongly disagree

1. I am constantly sampling new and different foods

2. I don't trust new foods

3. If I don't know what a food is, I won't try it

4. I like foods from different cultures


5. At dinner parties, I will try new foods

6. I am afraid to eat things I have never had before

7. I am very particular about the foods I eat

8. I like to try ethnic restaurants

Strongly agree

 **Efsa**
EUROPEAN FOOD SAFETY AUTHORITY

2 ways to join the poll:

- Go to **Menti.com** and insert the code **82978637**
- Use this **QR code**



Login to edit this Menti